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ABSTRACT

Papers are on the topics of: perspectives on the place of institutional research in policy, programs, and politics (William H. Faricy, Virginia P. Mitchell, Paul L. Kenepp, Dwight C. Smith, Jr., Wendell G. Lorang, Jr., Ronald H. Stein); assessment and management in higher education (Jerry W. Brown, J. Barton Luedeke, Adolph Katz, James J. McGovern); evaluating the evaluators (Larence Hoelcle, Boris Blai, Jr., H. William Coles); facilitating facilities planning (Loren Gould, Eric Brown); assessing outcomes (Ernest T. Pascarella, Patrick T. Terenzini, Judith Piesco, Lawrence Kojaku, Lou Genevie, Lawrence Podell, Paul Succop); planning and programming for faculty (Robert Lewis, Andrew T.Ford, Joseph J. Durzo); predicting and analyzing student attrition (David Nichols, Daniel L. Kegan, Susan Loveland, Barry Kaufman); planning and evaluating (James D. Tschechtelin, A.H. Kuntz, Richard L. Alfred); and formulating financial plans (Robert Grose). The keynote address is by Dorothy Goodwin. (MSE)

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Rational Decision Making and Political Realities: The Role of Institutional Research

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NEAIR

Papers from the Third Annual Meeting of the
North East Association for Institutional Research

November 4, 5, and 6, 1976 • Princeton, New Jersey

HE009356

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THE ROLE OF INSTITUTIONAL RESEARCH

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Amherst College

PREFACE

The third annual conference of the North East Association for Institutional Research occurred November 4 through 6, 1976, at the Henry Chauncey Conference Center, Educational Testing Service, Princeton, New Jersey. Over one hundred and twenty participants came together to discuss the theme: "Rational Decision Making and Political Realities: The Role of Institutional Research." The success of the conference was greatly facilitated by the work of Helen Wyant, Program Chairperson, and of Eldon Park and W. Scott McDonald, Local Arrangements Co-chairpersons.

Dorothy Goodwin, a member of the Connecticut Legislative Assembly and formerly Director of Institutional Research at the University of Connecticut presented the keynote address Thursday evening. Friday noon, Seymour L. Wolfbein, professor of Economics and Dean of the School of Business Administration at Temple University, spoke on "Seven Signs for the Seventies."

We wish to thank Connie Venturini, who typed this report of the meeting, and to acknowledge the assistance of Amherst College, Hampshire College, and the University of Massachusetts at Amherst.

March 1977

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Massachusetts/Amherst 76-77

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Daniel Kegan, Hampshire College 75-77

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INSTITUTIONAL RESEARCH: THE BASIC ROLE

William H. Faricy
Montclair State College

Institutional research is a hard topic to talk about, mostly because the name means so many different things. We can't take for granted what our fellow IR-ers actually do or what position they fill. Even the name of our quasi-profession can be misleading. Many people--both off and on campuses--seem to think it means either large-scale housekeeping or penalogy.

Whatever the handicaps of our name--and I'd just as soon change it, but I can't think of a better one--I'd like to suggest that those of us who use it should take it more seriously. We should accept--and insist--that our basic job is not only institutional but research.

It is important to stress this mission today, since funding for higher education is growing tighter and is more closely scrutinized by legislatures, state boards and commissions, or trustees. The danger is that critics might consider institutional research a mere academic luxury. Our best defense is not only that we are providing useful services to the administration, but--more important--that we are making an essential contribution to learning. If we really are helping to expand the fund of human knowledge, it is only because we are doing research.

By virtue of their self-defined role in our society, institutions of higher education have asserted a claim to be the major locus of efforts to expand knowledge. Our colleges and universities have championed scholarship and research in almost all fields, channeling great amounts of resources into efforts that promise to expand the horizons of knowledge. But the irony--almost the tragedy--of this extraordinary intellectual achievement is that these institutions have fostered the study of almost everything except higher education itself. Even the few exceptions make this generality all the more glaring.

Other kinds of institutions in our society share the advancement of knowledge and technology with the colleges and universities. Hospitals, research laboratories, industrial corporations are all part of the research establishment. But besides colleges and universities, none is concerned with the study of higher education.

I am suggesting simply that colleges and universities accept their proper responsibility for contributing to the advancement of learning in the area of higher education itself. Most colleges and universities do not have the resources to support a full-fledged department of higher education, but many of them do have an office of institutional research or a similar unit. A real office of institutional research should be a center for the study of higher education to the fullest extent that an institution's resources allow.

There are several ways an institutional research unit can serve as such a center. As I have already mentioned, it should conduct research into many aspects of higher education. Some might find it pretentious to call the usual IR surveys "research", and when I look at my own efforts I might even agree, although reluctantly. But if we are serious about our role in higher education, we will, nevertheless, make our efforts as scientific as possible. That means that we should use sound and appropriate methods for choosing samples, testing significance, and drawing conclusions; and that we should try to give our work a sound theoretical base by relating it to the existing research literature and to our colleagues' current work. Of course, using sound methods and consulting research reports implies that we are keeping abreast in our field, which in turn implies that we are going to professional meetings (like NEAIR conferences) and getting adequate financial support for professional self-development from our institutions. If we want to be professionals and be treated accordingly, we have to work a lot and ask for a lot.

Besides conducting research--or gathering the data that might someday be the basis for research--we can also fulfill our role as a local center for the study of higher education by disseminating information about the study of higher education to faculty, students, and staff of our institutions. Most colleges and universities need such a service: one reason is that many faculty and staff members are unused to the methods of empirical, hypothetical, social-science-type research. By phrasing our own reports accurately, by explaining the limitations as well as the significance of our findings, and by circulating well-done studies from other institutions, we can add to our colleagues' understanding. Secondly, most faculty and staff members--even those well-versed in social-science research methods--rarely or never apply the methods and concepts of their own disciplines to the world of higher education. The faculty may know a lot about philosophy, history, sociology, administration, etc., etc., but next to nothing about the philosophy of higher education, the history of higher education, the sociology of higher education, etc., etc. Even the education faculty are usually concerned only with the elementary and secondary schools. By bringing a broad spectrum of higher education studies to the attention of our faculty and staff colleagues, we can increase their awareness of this field.

Many of us would need more office help in order to provide such a service, but if we are serious about providing educational services to our institutions, we should make clear how such services can be of value to our institutions and actively seek the resources we need.

Another way to advance the study of higher education in our institutions is by creating a collection of books, journals, and resource materials. Since few of our institutions have departments of higher education, our campus libraries may not make much of an effort in this area. Few faculty members are likely to be aware of the CHRONICLE, THE JOURNAL OF HIGHER EDUCATION, the Carnegie Commission studies, or the Jossey-Bass volumes. But when a crunch comes--as it did in the New Jersey state system last year--some faculty members start looking for figures and analyses that can support an institution's claims. I actually had requests from anxious faculty members who admitted that they had never thought about the need to justify higher education until their own jobs came into question. Unfortunately I didn't have any easy answers or simple justifications, and I suggested that they had better start laying groundwork for a long stretch of lean years in academe, and that they could start by recommending that more resources be put into institutional research. (Assuming, of course, that an expanded institutional research effort will produce findings that favor higher education, a shaky assumption nowadays.)

For the past two years I have continued to add to a small collection of books that had been gathered for a course in higher education taught by our previous president. I recently distributed a list of the books just among the staff persons who work in the main administration building. To my surprise, three persons came to borrow books at once and several more shortly thereafter. Apparently there was a need for this service. I think even more staff members would use the collection if it were not for the fact that administrators--institutional researchers included--never seem to have enough time to read all that should be read. At any rate, gathering and making available books and pamphlets and journals is another way in which we can serve as a local center for the study of higher education.

Much of what we do as institutional researchers is routine but time-consuming data gathering and reporting. Many of us handle the HEGIS reports and a whole raft of requests for picayune information; some of us also prepare space utilization reports, budget requests, or annual reports. Of course such tasks are important. But insofar as we are in any sense striving for a professional identity as institutional researchers, we must consciously and actively avoid becoming merely tools of management. Only by taking an independent role as inquirers who seek to expand our knowledge of higher education can we fulfill our potential as members of a learning profession. Any institutional researcher who doesn't really care about learning would be a lot better off at IBM or General Motors.

EDUCATION EVALUATION AND THE COLLEGE COMMUNITY: A CASE STUDY

Virginia P. Mitchell
Mercer County Community College

I recently attended a meeting which had as its purpose the discussion of the results of the evaluation of a standard community college course which had been converted to a mediated format. Present were members of the administration, faculty members who had worked on the new course and on its evaluation, the chairman of the department, the outside evaluator, the Director of Institutional Research, and myself, a newly appointed Research Associate in the Office of Institutional Research. The Director, the evaluator, and I were interested in assisting in the planning for the future of the new course based on the evaluator's recommendations. The evaluation had been frought with all the real-world problems to which program evaluation is subject, and yet we were pleased that the conclusions were reasonably drawn and that the recommendations were sound.

Somehow, the rational planning process never got off the ground, however. The one tenured faculty person present began by repudiating the evaluation report and continued with an invective against the new course and, ultimately, against the administration which had originally pushed for "alternate modes of instruction." The two faculty members who had done all of the work on the new course seemed to be in agreement but preferred to keep quiet, as they were untenured. The evaluator who had worked with all of the faculty present while carrying out her evaluation was taken aback and I was mystified.

What really happened here? What went wrong? To fully understand, one would have to delve into the history of the relationship between the faculty of this particular academic department and the administration of the school. Without going into all that, one fact stands out. The impetus for the development of this course as an alternate mode to be used on campus came not from the faculty but from the administration of the school. Although members of the faculty committee had originally solicited the outside evaluator for the purpose of "objectivity," they claimed to have agreed that the final report would be a combined effort rather than produced only by the evaluator.

The problem illustrated by this example is complex. This paper will attempt to analyze some of the reasons why the expectations held by educational researchers for this particular meeting did not materialize and why instead there was an airing of bad feelings and frustrations.

In the first place, educational researchers in general and evaluators in particular tend to see the processes of evaluation and program improvement as a dynamic cycle and assume that program personnel will, too. Probably it is more often the case that program personnel see the initial planning stages of program development as the creative process and the rest as maintenance. This attitude may change, however, as the use of instructional development models which stress the statement of objectives and the design of test items in the beginning become more widespread. When evaluation activities are planned concurrently with curriculum development activities, the importance of the former to the establishment of a successful program is emphasized.

Another assumption evaluators often have is that program decision makers will want to constantly improve their programs. The educational researchers at the meeting described above held this assumption. The problem here was that we didn't recognize who the true decision makers were. It was some time after the meeting that we learned of past antagonisms between the faculty of this particular academic department and members of the administration. The impetus for the development of this particular course as an alternate mode to be used on campus had come not from the faculty but from the administration. Thus, the latter were the true decision makers, and, although the faculty were mandated to use this alternate mode in their classrooms, many did not support it and, therefore, were not particularly interested in improving it. In general, program personnel may feel the pull of inertia. They may feel their programs are operating well enough without extensive evaluation efforts, and, if programs are rarely terminated regardless of the way they are running, the incentive to improve them may drop off.

Thus, the evaluator who desires to involve program decision makers in the evaulation to insure that the data collected will be used by them may be faced with a lack of interest and motivation on the part of program personnel. Again, for programs utilizing instructional development models which stress the integral part played by evaluation activities, this may be less of a problem. Other possible solutions may be that the evaluator continue to stress the importance of the collection of evaluative data which has decision maker validity, i.e., which the decision maker wants and will use.

Secondly, it might be helpful for the evaluator, when reporting the information back to the decision maker, to recommend some decision making options which the data seem to suggest. This does not mean that the evaluator need take the stance of an expert making pronouncements concerning the future of the program. This is the easiest kind of report to ignore, since program decision makers will be convinced that the evaluator lacks the sensitivity to appreciate the unique aspects of their program. Rather, the evaluator should make these recommendations with tact and stress that many other options doubtlessly exist which may be equally effective and appropriate.

Finally, decision maker motivation may be increased by a strong administrative commitment to program accountability. If new programs have a period of probation during which they must demonstrate that their program objectives are being achieved, decision makers may be more interested in participating in evaluation activities. Similarly, regular periodic evaluations of existing programs should increase the commitment of program personnel to become involved in these evaluation activities.

It is often assumed by evaluators that decision makers will welcome recommendations for program improvement. What is more likely to be the case, however, is that decision makers welcome evaluation data which supports what they believe to be true and recommendations which will not take a great deal of time and effort to institute. This is not, I feel, an overly jaundiced view of program decision makers, but, rather, realistic in the light of the intense expenditure of time and energy which most program decision makers make in order to get a new program off the ground. A high degree of commitment is necessary for this, and it is easy to see how one might be threatened by an evaluation which may produce unfavorable results.

Not only may program decision makers stand to lose an investment of time and energy through the outcomes of the evaluation, but some may not see the process of such an evaluation as valid or important, even if they are involved from the beginning. Thus many ways can be found to circumvent unfavorable data, and this, I feel, was taking place at the meeting described above.

The members of the faculty, even those who had worked on the mediated course, for several reasons were not eager to see the course implemented on a full scale. The results of the evaluation, however, cautiously suggested that some students may learn better with this type of instruction than in the traditional mode. The response by the faculty members to this unfavorable outcome was to air all of their grievances with the evaluation process since its inception and to evade a discussion of future plans for the course.

A situation like this is very difficult for an evaluator. When different levels of decision makers are warring with each other, it is difficult for a rational dialogue to take place, and, hence, the results of the evaluation will probably be adopted by one side and repudiated by the other. While it may not be possible for the evaluator to remedy such a situation, it helps to recognize it as early as possible. This helps to scale down one's expectations of how much constructive decision making for the future will be based upon these results.

There is one final consideration which evaluators in Offices of Institutional Research should keep in mind. They are not outside the institution and will, therefore, never be viewed as "outside" evaluators, regardless of the precautions taken before and during the evaluation. Even the outside evaluator for the course described above was not seen as a disinterested party because she worked so closely with the Office of Institutional Research staff. In this situation, since the results supported what the administration wanted to see, she was seen by the faculty as being on the administration's side.

I think it should be kept in mind that a good, solid evaluation may not necessarily solve all a program's ills. The purpose of evaluation is to provide data for decision making, but if decision makers can't agree on what the evaluation results mean, future planning will be stalemated. In the case of programs or courses which were perhaps ill-conceived or which lack a strongly committed staff, little can be expected in the way of sound decision making based upon evaluation results. It is a good idea for evaluators in Offices of Institutional Research who find themselves working with such programs to be as clear as possible when reporting the data and what they mean. This certainly will not insure a favorable reception of the report, and probably nothing will. It will, hopefully, keep the evaluator from being seen as choosing sides and, thus, causing the evaluation to be viewed as invalid by one or the other faction.

It may also be the case that, should such a situation be recognized in the beginning, it would be preferable to have a truly "outside" evaluator tackle the job. The long-term costs in credibility which might be suffered by the Office of Institutional Research staff which could negatively affect many future ventures may not be worth the undertaking of such a loaded project.

REFERENCES

Benedict, L. G. Practical Guide for Evaluation. Windsor, Connecticut: Capitol Region Education Council, 1973.

Hutchinson, T. E. A critique of Federal Evaluative Methodology: A review of what was done compared to what should be done. A paper presented at the annual meeting of the American Educational Research Association, Chicago, 1972.

Hutchinson, T. E. Some overlooked implications of the purpose: To provide data for decision making. A paper presented at the annual meeting of the American Educational Research Association, Chicago, 1972.

Mitchell, V. P. Skill identification and subsequent development of training materials for the Fortune-Hutchinson Evaluation Methodology. Unpublished doctoral dissertation. University of Massachusetts at Amherst, 1975.

A COMPUTERIZED MANAGEMENT GRAPHICS SYSTEM:
ITS DEVELOPMENT AND APPLICATION FOR INSTITUTIONAL REPORTING

Paul L. Kenepp
The Pennsylvania State University

Abstract

In recent years, institutions have been producing large quantities of management-oriented information. The primary purpose of this reporting activity was to increase one's understanding of the institution's operation. With the expansion of computerized information systems, the volume of reports that was generated was overwhelming. This paper will describe a computerized graphics system which was designed to enhance the institution's reporting function. This system permits most types of management information to be displayed in graphics form. It is designed so that it can be readily incorporated into current systems, or it can be used to graphically display information that can be extracted from existing reports. This paper will discuss the motive and approach for system development and its application and potential uses in higher education institutions.

Introduction

Higher education administrators are being plagued with voluminous amounts of data which purports to assist their understanding of the nature and operation of the institution. In addition to studying the institution's processes, institutional researchers have increasingly employed the computer to aid them in carrying out their research. The increasing complexity of higher education processes and volumes of data dictate the use of the computer to achieve comprehensive, in-depth studies. The result, however, has been an excess of computer output that is useful for review and analysis. The data explosion has resulted in much useful information falling by the wayside due to the lack of time and energy for proper digestion by the institution's administrators, managers, executives or other decision makers.

Little relief from this data explosion is anticipated. Increased emphases on the management of higher education dictate an increase in the volume of necessary information. However, no matter how many computer-generated reports are available, they have little, if any, value unless they can be presented in useable form to the decision maker. Information must be comprehensible.

Graphical representation of data enhances comprehension and the translation of data to information and intelligence. The advantage of graphics is that the data can be communicated to the administrator in more comprehensible, intelligible, and, hopefully, useable ways than by conventional reporting paradigms.

Too many studies are hastily reviewed by the administrator without real visual understanding of the results. To extract required information and meaning from tabulated raw data, one must analyze the numbers and make the required translations. Computer graphics can systematically accomplish this in a more rapid and accurate fashion than human processes. In addition to addressing the problems of volume and basic comprehension of certain data, computer graphics can deepen the administrator's understanding of realities which the data represents than would otherwise be possible.

Not all information is conducive to graphics presentation. However, those research findings and managerial reports that use it should require less time and energy by the busy administrator to absorb the data and their meaning. Thus, insight to decisions can be achieved with minimal confusion which normally arises out of poor data formats and contextual misunderstandings. Rather than spending the time on "what do the numbers in the table say?" administrators, with the use of graphics, will more readily arrive at "how should I respond to the situation?"

Design Criteria

Before a graphics system can be developed, certain capability must be available to designers and users of the anticipated product. These include a plotting device, computer and software to process data and drive the device, and procedures that make this configuration functional. Assuming these things are in place, the task is to design a system to transform research findings, management information, or raw data to graphical representations.

Many computer graphics systems have been developed to produce specific graphs for specific purposes. The Penn State Management Graphic System (MGS) was designed to provide decision makers with several graphic options from the same set of data. It was designed in two separable modules: (1) compilation and summarization of data internally and (2) the analysis of that data for external display. This was done so that an operational distinction could be made between these two very different functions. The MGS used the modular design approach to allow for multiple data entry points into the system. This approach will enable the system to more readily accept data prepared from existing computer files, completed reports, or even from working notes.

Nature of Information

Initial design efforts involved a study to understand the nature of information as used by decision makers so that the system would accommodate a variety of data types and information relationships. From this investigation, we identified the basic components of management information to be characterized as "what" and "how much." These two elements are necessary to "identify and quantify" data. As we apply these two items successively, we can depict relationships for graphic representation. The presentation of similar relationships in a successive manner should then represent meaningful information. Figure 1 illustrates how one might graphically show comparisons of "what" and "how much."

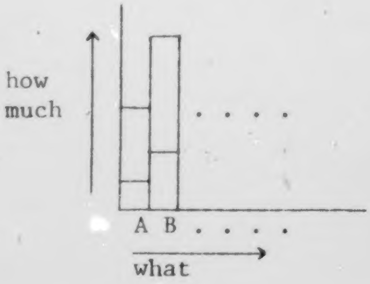


Figure 1

For example, consider the following four questions:

1. How many students are enrolled at Institution A?
2. How many faculty teach at Institution A?
3. How many students are enrolled at Institution B?
4. How many faculty teach at Institution B?

Question 1, in and of itself, has limited graphic value. If we combine question 1 and 2, some information emerges--namely a student/faculty ratio. Likewise, if we graph this relationship for several similar institutions, as in Figure 1, we can make a visual comparison of student enrollment, faculty, and student/faculty ratios among these institutions. By further qualifying these questions to consider only students and faculty in specific academic programs, the informational value of these graphs will improve significantly. This perception of information influenced subsequent design decisions.

Types of Displays

Academic administrators at all levels need to understand trends, distributions, and comparisons of many institutional phenomena and characteristics. Some examples are: distribution of faculty time among the various professional activities; comparative trends on enrollments among the various academic programs in the institutions; average section size of certain (any) courses; comparison of one academic unit with the institutional averages; comparison of average faculty teaching load among selected departments; and many more.

MGS was designed to generate pie graphs, histograms, and line graphs to support these kinds of information needs. These graphs can be used to show trends over time, comparisons between similar outcomes, and item distributions. These three display options accommodate most types of management-oriented information.

Operational Aspects

The MGS graphic results are produced off line. The main computer summarizes and analyzes data and prepares a magnetic tape for the off-line plotting by a smaller computer. This relatively slower process of actual graph production is more economically handled by a slower, less expensive machine. Calculations for plotting time and procedural feedback loops to the user were designed to control this operational activity.

Considerable effort was made to interface with existing computer systems. Output from these systems is customarily produced in tabulated form. Thus, it was necessary to examine the reformatting requirements to have this tabulated data to be passed on to the MGS with a minimum of program modifications.

In addition, it was important to have the manual data preparation chore as natural and straightforward as possible. Often when a system provides several options and extensive flexibility, its data can only be prepared by a technician who is familiar with the inner workings of the system. To help insure wider acceptance and use of the system, it was desirable to have simplified rules for data preparation.

System Capabilities

A primary consideration in designing computer base systems is to maximize flexibility and user options while minimizing the drudgery for the user of communicating his options to the system. A system that is characterized by a few well-designed capabilities with nominal input requirements will be used more than the "do everything" system that has a long list of special rules required for its use. Options are communicated to the MGS with few format rules and are designed to provide substantial flexibility to the user in formulating appropriate display types and descriptions.

Display Options

Pie graphs, line graphs, and histograms represent the most common graphs used for business applications. The user may choose any of the three types for his data display. To determine the one that should be selected, one must consider the relationships of the data and what meaning is to be derived from them.

The line graph and histogram may be used to display several "levels" of information simultaneously. This option will produce several lines on one graph or segmented bars on the histogram. In this way several comparisons can be analyzed on the same graph.

The user may formulate the title and comments for each of his graphs. These should describe such things as data source, information time frame, and other factors that will clarify the meaning of the display. Titles will be centered beneath each graph and comments are listed near the bottom left margin.

For the line graph and histogram, categories are noted along the horizontal axis (in Figure 1, A and B represent categories). The value associated with each category is plotted and referenced to a vertical scale. There are no restrictions on these values since appropriate internal scaling is calculated for "best fit" on the output graph.

Some graphs may be used for reports or maintained in "working folders" for subsequent referral and study. Other graphs may be used for presentations or for wall displays. This system will permit the user to select various graph sizes ranging from an 8½" x 11" to approximately 22" by 32".

Other options include a grid for the line graph and provision to identify separate display levels (for the line graph and histogram) through the use of comments. In addition, individual lines of a multiline graph may be identified with appropriate labels printed near its extremity.

Grouping

Often information cannot be effectively displayed in one graph to show the desired relationships among its components. By producing several graphs and employing the use of the size option, the MGS can generate a series of graphs to facilitate visual comparisons.

For example, the grouping option may be used to compare the distribution of faculty by rank of several colleges within the institution against a corresponding distribution of all faculty in the institution. In this example, the rank distribution of all faculty would be displayed via a large pie graph and the smaller pie graphs for each college would be positioned around it in a circular fashion.

Free Format

When data are prepared manually, all options are communicated to the system by coding in a "free format" mode. The "key word" concept is used so a natural left-to-right keying procedure can be used.

Figure 2 represents a request for a pie graph with 5 categories to be plotted on page-size paper (8½" x 11"). The graph will illustrate a distribution of faculty rank for a given college.

```
1, TYPE = PIE, SIZE = PAGE, CAT = 5
2, FACULTY RANK DISTRIBUTION FOR COLLEGE A
4, INST, 60, ASST, 90, ASOC, 120 FULL, 92, OTHER, 30
```

Figure 2

The "1" line identifies the options that are to be used for the display. The "2" line identifies the title for the display and the "4" line contains the data that are to be plotted.

Data Source

Existing computer systems can readily adjust to the data formatting requirements of the MGS. With minor modification, these systems can use the MGS to produce graphic output that complements their standard production reports. It is not the intent to have the MGS replace existing reports produced by these systems (although this may happen), but rather to provide the option to review the information via a graphical representation. Each existing computer reporting system is a potential candidate to use the MGS.

New institutional studies and information systems can, by initial design, incorporate the MGS capabilities. Knowledge of its capabilities may assist in the design of meaningful output to depict the study results.

Another source of data for graphics display is the numerous reports that have already been produced. To obtain a "new look" at these reports, data can be extracted and formatted for processing by the MGS. This manual process would result in producing a graphics request similar to the one shown in Figure 2. In generating graphs from existing reports, one can select any of the available graphic displays and options.

Some Examples

The three types of displays are illustrated in Figures 3, 4, and 5. Sample data were selected to help illustrate the use of each type of graph.

Operations Document

As part of operations control, the MGS will generate a document for each graph that identifies various attributes of the plot request. This document identifies what options are selected, numeric graphic values, title, comments, and the estimated plot time. It can be used to identify specific values of plotted data and as a detailed record of each graph produced.

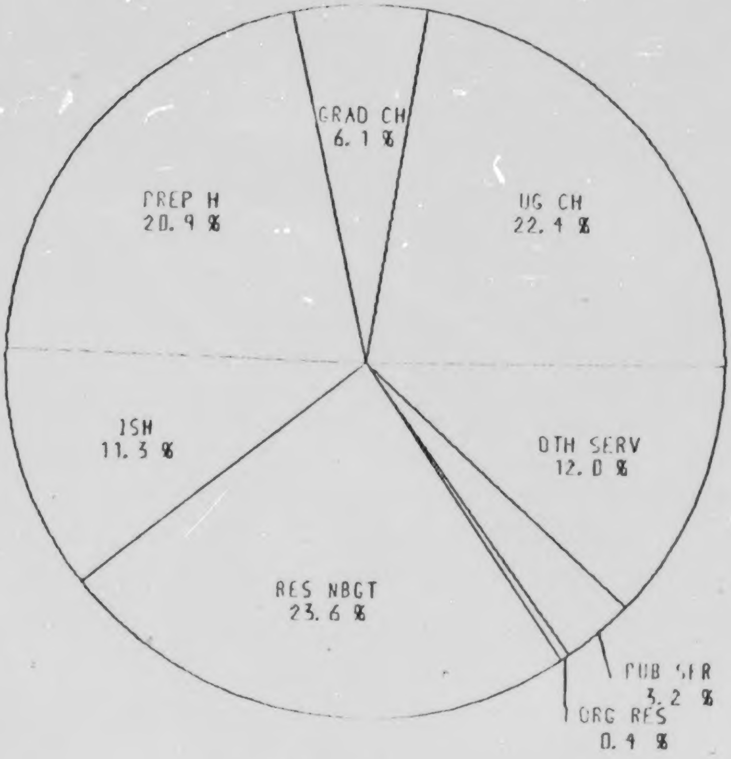
Conclusion

As decision makers in today's institutions are called upon to review and digest more and more information, it becomes imperative to devise methods and techniques that will assist the administrator in understanding what is reported. Computer graphics can play a significant role in removing much of the drudgery in this review process.

The MGS is an attempt to minimize confusion and time in the information review process. Future efforts will no doubt involve an extension of the capability to serve a broader segment of academic administration. It seems the integration approach of adapting computer graphics to present computer systems along with the potential of new graphics terminals now available on the market will provide incentives for future development.

Graphics may not be a panacea for management information reporting. However, since it is not complicated by numeric tabulation, the busy administrator can readily grasp its true meaning. Thus, he can spend more time deciding his alternatives rather than interpreting the data. Those information systems employing graphics will most likely be more popular and will no doubt be called upon regularly to provide information to the decision maker.

GRAPH 10



FACULTY ACTIVITY
COLLEGE B

UG CH - UNDERGRADUATE CONTACT HOURS
GRAD CH - GRADUATE CONTACT HOURS
PREP H - PREP HOURS
ISH - INSTRUCT SUPPORT HOURS
RES NBGT - RESEARCH NOT SEPERATELY BUDGETED
ORG RES - ORGANIZED RESEARCH
PUB SERV - PUBLIC SERVICES

11/17/76

Figure 3

This pie graph shows how faculty reportedly spends his/her professional time. Comments are used to indicate the meaning of the abbreviated labels. When the sector size is not large enough to hold the label and its value, they are printed outside the circle and identify the sector as shown.

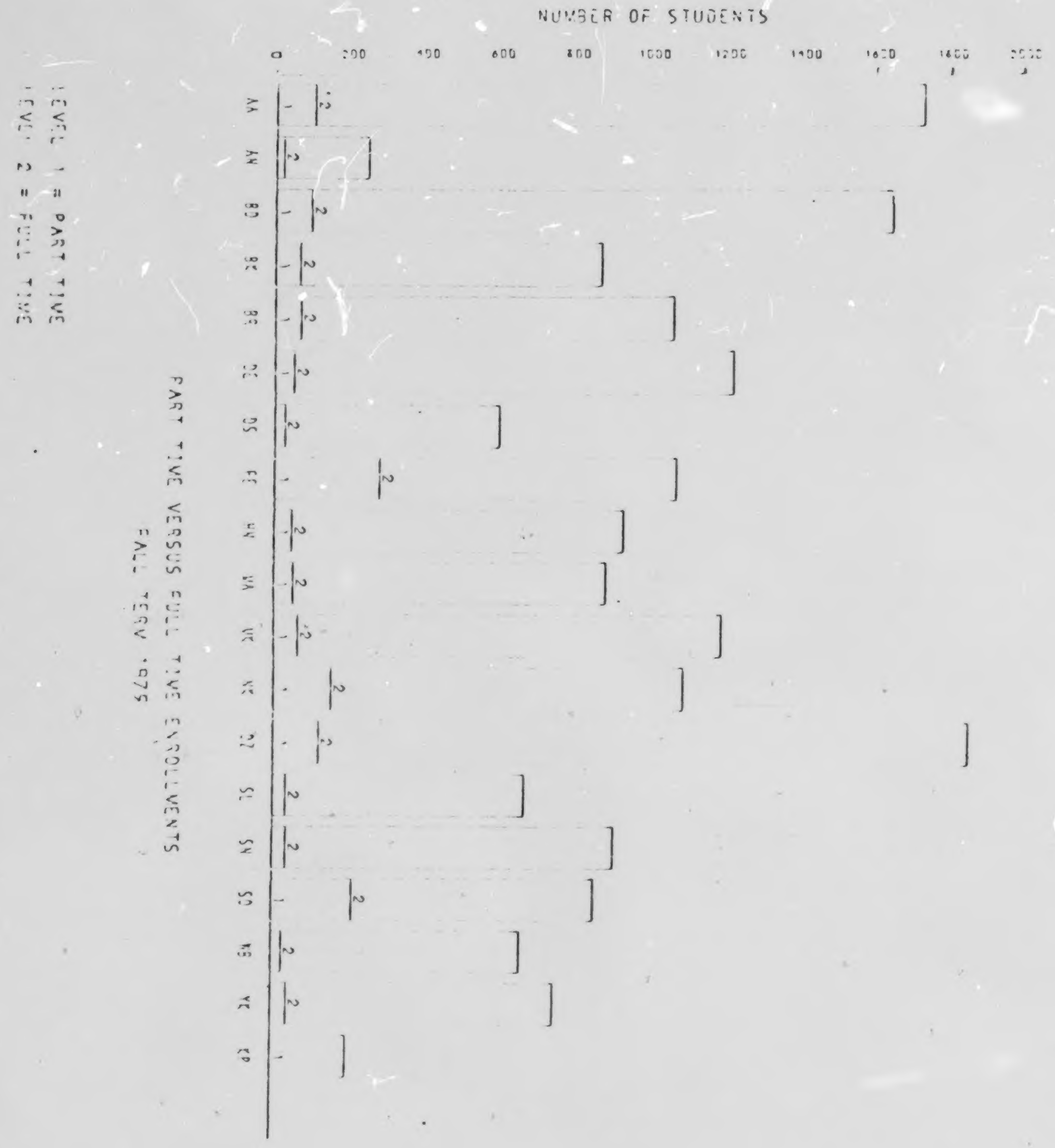
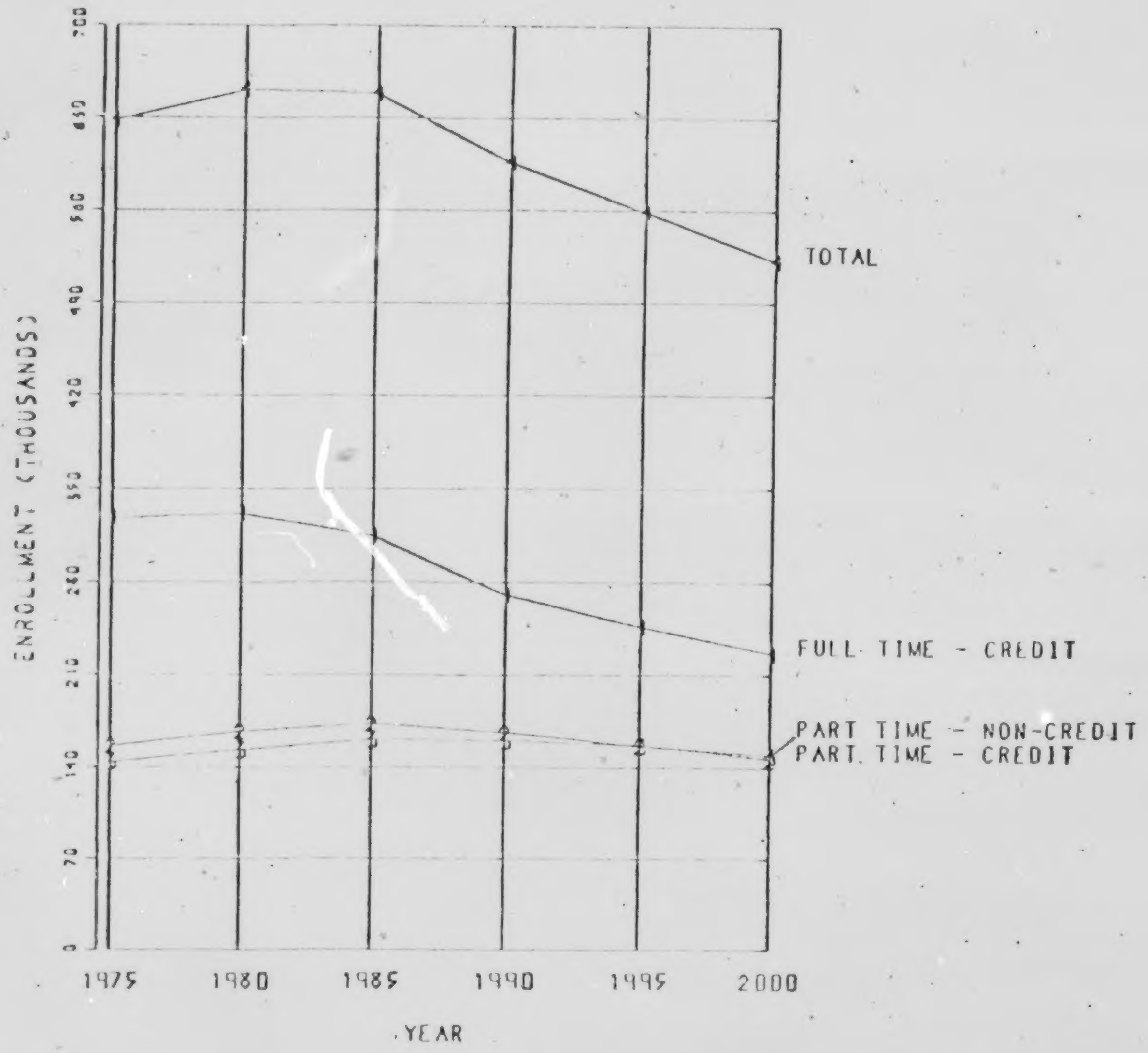


Figure 4

This two level histogram shows a comparison of full-time and part-time enrollment at nineteen campuses. Level 1 and 2 represent part-time and full-time respectively. The entire bar indicates the total enrollment.



HEAD COUNT ENROLLMENT BY ATTENDANCE STATUS AND TYPE OF ACTIVITY

Figure 5

The sample data in this line graph represents projected higher education enrollments in five-year increments to the year 2,000. The multi-line capability enables one to show the effects of various subgroups on the total. The labels at the end of each line may also identify the lines by properly being noted under the graph as comments. The grid option enables the viewer to more readily determine enrollment increases and decreases over specified intervals.

REFERENCES

Mezel, L. "Computer Graphics for Society," Computers and Automation. October 1970, pp. 28-31.

Miller, I. M. "Computer Graphics for Decision Making," Harvard Business Review. November 1969, pp. 121-132.

Potts, J. S. "The Place of Computer Graphics in the Business Community," Data Management. September 1975, pp. 44-49.

Shostack, K., and Eddy, C. "Management by Computer Graphics," Harvard Business Review. Nov.-Dec. 1971, pp. 52-63.

Wyatt, J. B., and Zeckhauser, S. "University Executive and Management Information: A Tenuous Relation," Educational Record. Summer 1975, pp. 175-189.

PROGRAM TERMINATION AND RETRENCHMENT: THE ROLE OF INSTITUTIONAL RESEARCH IN PROGRAM EVALUATION AND ACADEMIC PLANNING

Dwight C. Smith, Jr. and Wendell G. Lorang, Jr.
SUNY at Albany

Introduction

During 1975 and 1976 the University at Albany was forced to reduce its teaching faculty by 33 positions, or approximately four percent. We had two basic options. Either we could take the easy way out, with debilitating and arbitrary results, by applying some form of seniority rule; or we could undertake a programmatically-structured retrenchment based on some set of criteria for determining which academic areas (amounting to 33 faculty) we could do without. We chose the latter course as our major strategy (though tactically, we did make some temporary reductions on the basis of attrition, with the promise of restoration as our primary strategy worked out), and terminated eight doctoral, six master's and nine bachelor's programs.

The Office of Institutional Research supplied some of the information on which those decisions were made, and the purpose of this paper is to describe the process and our role in it. We will do so in three stages: a description of the factors that defined the historic context for campus decision-making; a review of the process itself; and the conclusions we draw from the experience that are pertinent to the development of an institutional research function.

The Gathering Storm: External Forces that Led to Program Review and Retrenchment

Rare indeed is the campus that controls its own destiny. At best, one can hope for sufficient equilibrium to withstand temporary or unexpected changes in the environment, and enough initiative and momentum to maintain headway in heavy seas. The unexpected may be the consequence of multiple factors of varying significance, but we would single out five that were particularly influential in defining Albany's task environment in 1975-76.

First, the growth expectations of the Sixties. In 1962 Albany was designated as one of four university centers to be developed within the SUNY system.

We then had an enrollment of 3,800 students and a curriculum concentrated upon undergraduate preparation of public school teachers and graduate programs for persons associated with public education. We were encouraged to become a comprehensive university, emphasizing liberal education and graduate study to the doctorate in virtually every program. During the early Sixties a new campus was built for a student body of 10,000; it was hardly finished when SUNY's 1968 Master Plan was unveiled and we were "promised" growth by 1975 to 17,500 full-time-equivalent students, accompanied by a doubling of our physical plant.

It is obvious in retrospect that the principal force behind external growth expectations was capital construction. Our efforts were shaped to justify it. Enrollment projections, for example, were developed irrespective of demography to answer the question, "How many students will we have to enroll to fill our facilities?" At the undergraduate level our avoidance of the real world had some justification; we had (and continue to have) eight applications for every freshman space. But there was no anticipation of the declining high school population of the Eighties, or the likely glut of newly-conferred PhD's, and no long-range concern for the budget implications of either a capital construction debt (which, under State budget procedures, is not part of the campus budget) or the overall cost of assuming that half our students would be in graduate programs. Nor, with respect to the latter, was there any attention given to the practicality of such a graduate emphasis. The fact that in the late Sixties only a handful of institutions in the country approached a 50-50 split between undergraduates and graduate students--with Rockefeller University, Cal Tech and Chicago leading the list--was only mildly interesting.

And why should we have worried? No one else then foresaw what would be happening fifteen years later; all our external observers expected and encouraged growth; and any contrary voice, given our enrollment-driven budget, would be arguing the unpopular cause of fewer faculty. The result: the inculcation of a set of expectations concerning continuing faculty and program expansion across a broad spectrum of academic offerings.

Then the environment shifted abruptly, with the standstill budget period of 1970-75. The period began unexpectedly at the end of the Sixties, when the first phase of capital expansion was deferred in three successive budget cycles. We have never completely understood the State's change of heart; the most practical explanation revolves around the cost of an extension to the architectural concept of our academic podium. The increasing costs of the South Mall and a sense that the Albany community had had its "share" of State construction; the need to proceed with construction at the other centers; the relative political clout of our legislative delegation, contrasted with the legislative support for the other University Centers--these may also have influenced State policy. The only really clear point is that in the deferral of construction decisions there was never any hint of skepticism regarding the enrollment projections that justified more space.

At the same time, the operating budget came upon increasingly harder times. Our enrollment base continued to increase on a year-to-year basis, but no new faculty were authorized. Other campuses were also restricted; but their projected expansions were even greater than ours, with the result that they could show net increases in faculty even with tighter faculty-student ratios. At Albany, however, as enrollment increased by 15% from 1970 to 1975, the number of faculty actually decreased by 1½%.

At first, we believed the halt in expansion was only a temporary pause in our march toward the 1968 Master Plan goals. Indeed, in 1970 we were asked for preliminary enrollment estimates to 1980 that continued the upward climb. But the third denial of capital construction was the deciding factor in our conclusion that for practical purposes our lofty dreams were not about to be met. This realization came on the eve of requests for input to the 1972 Master Plan; it was buttressed later by Alan Cartter's sober warning to AIR in 1973 concerning the lean years of the Eighties. We decided then that while some growth was possible, we should be anticipating a plateau more consistent with our existing capital plans (note that space standards had changed since its completion, so that the same space would accommodate--appropriately--more students) and more sensitive to future enrollment pools. The result was that while the other three centers responded to the 1972 Master Plan call simply by deferring their 1968 enrollment projections--i.e., transforming 1975 targets into 1980 targets, with continued growth beyond that--we suggested that our 1980 target be reduced from 17,500 to 14,000 full-time-equivalent students, with no appreciable growth beyond that level.

We described it to ourselves as "steady-state," but it was not that--yet. Our enrollment level then was approximately 11,500 students, so our projection anticipated some growth. But more importantly, it recognized (however dimly) external realities, and it acknowledged explicitly that there would be a time in the foreseeable future when there would be no more growth. That was a critical planning decision.

Meanwhile, the need to restore a modest momentum of growth was evident. In an enrollment-driven budget process, more faculty depend on more students; and with neither, program development on a wide front is impossible. But now, the extent of external misunderstanding of our planning assumptions burst upon us unexpectedly in late 1974, when preliminary soundings were being taken in anticipation of the 1976 SUNY Master Plan. The process had changed. Four years earlier we had been asked to project our own enrollment dreams; this time we were presented with a set of recommended goals for 1980 and 1985, and asked to respond to them. SUNY's proposal to the campuses anticipated an enrollment peak in 1980 below that forecase in 1972, followed by a gradual decline in students through the following decade. At first we were glad to see this intrusion of reality, however slight, into the planning process; but then we looked at the enrollment distribution by campus and found that the system-wide adjustment to a lower target had been distributed among the four centers in proportion to the target goals set in 1972. The result for the other three centers was a continued prospect of growth to 1980, followed by declines that still left each of them at enrollment levels higher than those of 1974. For Albany, however, there was no growth at all forecast to 1980, and a decline thenceforth below the then-current budget level.

Two inferences were obvious. First, the proposed adjustments had been derived as an easy paper solution to an arithmetic problem, without reference to what was actually happening on any of the campuses, with the result that Albany's prior discounting of overly optimistic goals was ignored. The result was a double penalty of a belated, centrally-determined reduction on top of a previous, campus-initiated reduction. Second, the proposed adjustments reflected a primary concern for justifying capital construction commitments rather than academic program development or enrollment demand.

Our response was to argue for a return to the goal of 14,000 students set in 1972, with its implied promise of resource growth. To support our argument we turned to historic data on application demand, both numerically and qualitatively, for both graduate and undergraduate admissions, and to degrees awarded as a measure of program accomplishment, and set them in the historic context of master plan and campus projections since 1968. We put the argument together as a visual display (affectionately known on campus as "the magic lantern show") that was shown widely on campus to our faculty and our alumni constituency; and we took it to Central Staff as our formal response to the proposed 1980 targets.

It was convincing. The impact of five years of standstill resources and growing enrollments was finally recognized and translated into corrective action. We were authorized to submit immediately a supplemental budget request for 1975-76 (it was then February 1975, and the legislature was already considering the regular Governor's budget) that would begin a recovery to the 14,000-student goal.

The legislature did not act on the supplemental budget until mid-summer. When it did, our request was denied. Unfortunately, we had already had to commit our admissions policies to that level of growth. Thus the immediate effect of having restored momentum was to have been placed in an even more depreciated position, vis-a-vis faculty resources, than we had been before. Beyond that, it became evident as the final Master Plan goals were unveiled (in June 1975) that the initial intrusion of reality into the preliminary enrollment numbers had been successfully resisted. The new goals consisted of moving the centers' 1980 targets to 1985, with a continued expectation of growth to that point for all of them.

Of course, the question of growth may have become moot following the budget crunch that began that Fall and hit full force the next January with new, significantly curtailed resources for Albany's 1976-77 budget. It was at this point that we began to accept "steady-state" as a continuing condition. The projected loss of 33 faculty was a deciding blow. Fortunately, one of the by-products of the preceding Spring's efforts to reestablish momentum for growth was a recognition that even as capital construction-based enrollment justifications were no longer viable, demographically-based (and presumably more defensible) enrollment justifications by themselves would not insure resource support. Increasingly skeptical and close scrutiny by state policy-makers and funders was a clear signal that we would have to demonstrate that the programs we offered were worth support at any enrollment level. It seemed important to us, for reasons that will be discussed below, that initiative for program evaluation rest on campus, if campus-based priorities were to have any future.

As enrollment projections and capital construction waxed and waned, and as budget crises became increasingly severe, a final external force emerged to threaten campus equilibrium: external review of graduate programs. The notion of program evaluation was not new; even in the halcyon days of broad-scale expansion in the Sixties our internal governance structure consistently questioned the prospective quality of existing and proposed new programs. Our graduate office had initiated a schedule of external program reviews six years ago for the purpose of guiding departments toward effective development, formalizing a process that began in 1964. The reviews were prepared for internal audiences, not as external public relations documents, and thus when the hard facts of retrenchment hit, we did have a considerable body of material available for review committees that reflected candid outside evaluations of program merit.

The three-pronged threats of lower enrollments generally, a perceived glut of advanced degree holders, and a prospective decline in public funding for postsecondary education became visible in New York State in the early Seventies. The State Education Department and the State Board of Regents decided then to react to initiating their own state-wide review of doctoral programs, under their interpretation of state law providing for approval and registration of new academic programs. That project continued, though it is currently clouded by a court controversy between the Regents and the SUNY Board of Trustees over the Regents' authority to deregister programs. Without attempting to deal with the legal issue, or with any of the partisan questions that obviously would infect an academic power struggle like this one, it would seem that the controversy in policy terms is whether continuation of academic programs should be determined by focusing upon a comparative state-wide review of a given discipline (in which circumstance a relatively new but promising program is burdened with demonstrating instant effectiveness against an older and more established program); or whether program development should be focused upon the coherent growth of a set of programs on one campus that are linked by an overall statement of campus mission. Even as the issue of initiative and authority has remained unsettled, it is clear that the alternative of external review has had a clear influence upon campus-based policy formulation.

Rush to Judgment: Comprehensive Review of Academic Programs

On January 8, 1975, President Louis T. Benezet named a Select Committee on Academic Program Priorities composed of ten teaching faculty and two students. It was to report by May 15, 1975, recommending at that time "priorities for the future of Albany's academic programs assuming continued steady-state resources or, at the most, limited additional resources for those programs in the best position to use them." While a commitment to a full range of undergraduate and graduate education, research and public service was recognized, it was also understood that the current climate required "hard choices among the programs which are to be advanced, those which are to be held at a minimum, and those which may have to be discontinued at the doctoral level." (emphasis added)

During a busy 120-day schedule, the effort of the Select Committee was divided equally among three activities: information gathering, criteria setting and evaluation, and priority setting. On the matter of criteria setting, the committee consulted several campus groups before taking final responsibility for the six chosen. One chapter in their report is devoted to discussion of them--Quality and Effectiveness (considered the "essential criterion"), External and Internal Demand, Present Costs and Improvement Costs, Leadership and Capacity for Growth, Academic Centrality, and Relationship to SUNY System and Regional Needs.

Campus-sponsored program reviews conducted over the last ten years by external evaluators and accrediting agencies, as well as self-studies, annual reports and, more recently, State Education Department reviews, were heavily drawn upon by the committee in their work. Files for every program were developed which also included recent faculty vitae, manpower trends, placement information, enrollment and faculty workload data, and comparative information about sister programs in SUNY and in the State. Interviews with departmental personnel were also held whenever the need to do so was expressed in the committee's deliberations.

In presenting its findings, the committee made clear several points which help place its work in perspective. First, it pointed out that recommendations were made "only to the extent that data were available to warrant such recommendations." Secondly, the committee refrained from reaching out to recast Albany in any fundamental or radical fashion. And thirdly: "It is imperative that other mechanisms be established which can survey the SUNY-Albany campus as a whole--and can assess priorities and goals on a longer term basis than was possible for the Select Committee."

The recommendations of the Select Committee were to terminate two academic programs, the Department of Astronomy and the Allen Collegiate Center. While other units were recommended, in general terms, for increases or no change in resources, in many cases the committee made pointed statements and recommendations which for some departments clearly indicated that they would continue to be closely reviewed.

Reception of the Select Committee report by seriously affected units was as would be expected. Otherwise, even those units criticized, received the document as an important, well-founded and well-written first step in coping with the problems of steady-state. The evaluation, moreover, was still on a one-by-one basis--each program being evaluated on its own merits, not in relation to other programs on campus. The committee intentionally did not anticipate that a steady-state situation would fast deteriorate into one of budget reductions. The result was that it probably provided the subsequent President's Task Force on Priorities and Resources with a more useful assessment and a much needed philosophical underpinning from which to begin its work. Even so, the concluding observations of the Select Committee report were painfully prophetic:

> "In the view of the Select Committee, this University Center cannot continue to attempt at full speed horizontal development on all levels (the comprehensive University model). It simply cannot

> do everything at once and do it well.... We must become more selective in our goals and wisely choose among the options available.... These decisions are not required simply because of the exigencies of financial pressures, but also because of the responsibility of this University to itself and to the larger community.... It best fulfills its missions by articulating its goals and organizing its resources in ways which optimize the attainment of those goals... (P)rograms which are not central to its mission, which have demonstrated an inability to operate effectively, or which have not met the test of quality, must give way to those programs which can meet those tests."

A deteriorating fiscal picture--which the Select Committee had properly refrained from exploring--developed within nine months of the release of its recommendations. Anticipating an announcement of drastic budget reductions, the administration at SUNY-Albany proceeded to develop a strategy for handling such a situation. Because of the expected magnitude and implications for the academic program of the campus, a faculty committee drawn from the governance bodies of the campus and other leading faculty was seen as necessary. One year later, almost to the day of the Select Committee's establishment, our newly inaugurated President, Emmett B. Fields, appointed such a committee, the Task Force on Priorities and Resources, comprised of thirteen teaching and non-teaching faculty and three students. Its charge had four parts: 1) to assess and assign priorities to all academic programs and recommend where to take the budget cuts which had been specified by number of positions and total dollars within function (instruction, research, public service, general administration, etc.); 2) to be guided in its assignment by three strategic principles for the shaping and strengthening of SUNYA: the centrality principle; the building from strength principle; and the so-called "public policy thrust"; 3) to utilize comparative enrollment and workload data; and 4) to present a final report in thirty days.

In addition, the administration proceeded to develop its own tentative plan which met the required short-range reductions within a long-range assessment of program development that would mean the strengthening of some programs and the paring, even termination, of others. The same data available to the Task Force was used to develop that plan. Eleven criteria were identified and used in evaluating each program: potential staff quality, potential impact on public front, centrality, demand by majors, demand by non-majors, library holdings, facilities and equipment, demand for graduates, locational advantage, comparative advantage and cost. This plan was given to the Task Force after it had completed its own evaluation of programs. This approach, involving frequent contact, kept each group informed as to the progress in meeting budget reductions and the implications of evolving recommendations. In combination with the extensive material and work of the earlier Select Committee, that interaction enabled the campus to accomplish its task. The basic philosophy expressed so well by the Select Committee--that selectivity for qualitative growth would have to take the place of undifferentiated horizontal expansion--was thus extended.

The Task Force's work was distinctly different from that of the earlier Select Committee. (Its report was similarly affected, being cryptic and written much less eloquently than that of the Select Committee.) Given its deadline, it had to rely almost completely on regularly available reports, supplemented by material (reviews, etc.) which had been collected by the Select Committee. Information gathering thus received less attention, while evaluation was given more. The Task Force also was dealing in its assessment and preparation of recommended cuts with non-instructional (administrative and service) programs as well as academic activities. These areas were understandably lacking in self-studies, much less outside reviews. In addition, the charge to the group did not permit a one-by-one evaluation of programs. Rather, it required a weighting of each program in relation to all others, for the express (and clearly threatening) purpose of eliminating 33 faculty and 61 FTE non-instructional positions at the end of that academic year.

But the task was not simply position-cutting. The Task Force, while making recommendations which would deal equitably and humanely with the immediate issue of position reductions, also went on to postulate an academic strategy that "enhanced as much as possible the long term achievement of a first-rate University Center." This task implied more than just collecting positions from among those departments which happened to have vacancies because of appointments expiring in 1976 or 1977. Historic workload inequities, shifting student demands, and the future academic profile of the university were addressed. Recommendations, therefore, were made not only for 1976-77 but for 1977-78 in order that units from whom lines were "borrowed" (to meet short-range reductions) could be repaid while others could have their resources reduced or increased following longer-term expectations of the Task Force.

The recommendations of the Task Force were immediately presented to "affected units." Their responses were reviewed by a campus governance body. That body concluded, in a report issued ten days later, "that the Task Force carried out a difficult task with impartiality and dedication to the concept of a University Center." Recognizing the burden of proceeding without the benefit of a fully developed mission statement, the group recommended that any future reallocation of resources "be further reviewed in the context of a coherent institutional plan." Subsequently, the Task Force recommendations were accepted by the President and the SUNY Board of Trustees. In sum, their academic impact was the phasing out of seven doctoral programs, five master's programs and eight bachelor's programs.

The campus has not yet recovered from this fast-paced sequence of events. At present, even the attempts to frame that "coherent institutional plan" are affected by the events of last Spring, the continuing force of externally determined deadlines and the maturation of faculty participation through the governance process. Program evaluation had suddenly evolved from a periodic process, involving only a department and its outside reviewers, into a public--and, with the Task Force, threatening--process involving not simply the direction of its support but perhaps even its existence. Finally, the move into a planning-evaluation-resource allocation process, while being recognized as long overdue, introduced further uncertainties in an already uncertain future.

Final Score: The Place of Institutional Research in the Campus Decision-Making Process

From this account of the forces leading to program termination and retrenchment, and of the processes by which those decisions were made it is tempting to draw all manner of conclusions. What happens to consensus, morale and institutional loyalty, for example, when the silver lining of "not yet," that accompanies negative decisions during a period of growth, is replaced by the gloomy interior of "not at all" that characterizes negatives in a steady-state economy? We have determined to avoid such intriguing intellectual by-ways, however, and to look instead at three conclusions that derive from the fact that the Office of Institutional Research was an important contributor to the decision process we have described. First, our contributions were not accidental; they were the result of being prepared. Second, our contributions were important but limited; it is important to recognize where the limits were. Finally, our contributions can continue; they will be particularly effective if the right managerial decision patterns emerge from the experiences we have just undergone.

Let us look briefly at each of these conclusions.

First, consider the process of becoming prepared. As the campus office responsible for reporting and analysis of enrollments, student and faculty characteristics, workload, and instructional costs, we have had extensive experience with both information and the processes by which it is obtained and managed. Originally, our function was perceived as externally-oriented. It would have been possible until very recently for us to remain fully occupied in this way without telling anyone on campus what was going on.

But from the outset (1967, when our office originated) it has been our philosophy that knowledge is indeed powerful, especially in the hands of those agencies off campus who are in a position to second-guess our intentions, and that, as a matter of self-protection, campus management should have some inkling of what others know about us. We have, therefore, circulated considerable information to deans and chairpersons, to prepare them to fight--either as a body collectively, or among themselves--for the resources that quantitative measures (enrollments, faculty workload) could justify.

Most of the time the response to our efforts ranged from patient tolerance to disinterest. We remained patient in turn, expecting a day when the value of data would be recognized; and in anticipation of that day bent our efforts to the improvement of information systems and their data products. The importance of those efforts cannot be overstressed; without functioning systems we could not have responded to later information demands.

Our lack of internal acceptance was probably due to two factors. First, we had designed the wrong format. Our data was typically arrayed so that one might easily compare activities of several programs across a moment of time. That is the way institutional research has always looked at data; and while it may help the budget analyst, it says little to the dean or chairperson about the development of any given program over time. We finally got the message in the Fall of 1974, and rearranged our internal reporting formats to illustrate five-year trends in faculty resources, enrollments, costs per credit and degrees awarded--our primary measures of program activity.

The timing was fortuitous, because the other factor affecting reception of our data was that it didn't seem to make any difference. No one could demonstrate how a single one of our numbers had affected resource allocations. But when the Select Committee began reviewing graduate programs in the Spring of 1975, it looked for some quantitative information and found reliable and appropriate numbers available in our redesigned "program indices" report. Its historic approach was a nice match for the historic approach to qualitative information that characterized our external program evaluations.

What we had was limited, however, and its limits are our second conclusion. Academic development is more than statistical measures, as both the Select Committee and the Task Force were quick to note. In the case of the Task Force review, for example, only three of eleven administrative criteria were numeric; the other eight were subjective measures of program quality, centrality, etc. Because of our strategic position as the office in the center of demographic reporting, analytic studies, long-range planning and information systems development, we had a major role in defining all eleven criteria, and in specifying how the numeric and non-numeric results might work together. Our numbers, by and large were there as a test, or reinforcement, of qualitative assessments, and that was an important function for them to perform--but not the primary one.

Our campus emphasis on quality was appropriate to the question of program review. It stands in sharp contrast to the external accountability requirements under which we ordinarily labor. Accountability prompts reams of printout (or, as computer capabilities expand, millions of bits of information) to federal, state and other outside organizations in a position to mold our task environment. They are pages of numbers, and we can easily assume, by their volume, that numbers are all that count. Our experience shows, however, that as we emphasize program review as the basis for resource allocation activities, two important things occur that provide an alternative approach to accountability: evaluation moves from the heavily numeric questions of input--how much students entered the classroom, what was the salary cost of their instructor--to the more subjective questions associated with program outcomes; and as that occurs, our traditional approach to data analysis may become increasingly irrelevant to effective campus management. If we really mean to shift the focus, via program evaluation, to analyses of outcomes, are we entitled to burden academic administrators with performance data that continues to focus on input?

That question leads to our final comment, concerning the future of institutional research. We think it is bright, particularly because it offers some intriguing challenges to the ways we have always looked at data and information systems.

Our argument in this regard rests on a central assumption that there should be a planning-allocating-evaluating-reallocating process undergirding campus management. This is not a new assumption, but what we mean by it may indeed be novel for most of us: we want to take three functions--master planning, program evaluation and analytic studies--and fit them together as a functional management tool. Their individual histories have been disparate. They have operated ordinarily in relative isolation from each other and even (and this seems particularly true of master planning) in isolation from the management process. We intend to overcome isolation by a comprehensive approach to information that will include master plan goal setting and the establishment of evaluative criteria; identification of resource allocations with those goals and criteria; development of statistical data that will describe current activity in terms of evaluative criteria; and utilization of annual reporting processes to interpret evaluative data in terms of prior goals and to establish a framework for modifying (as experience may indicate) the goals, criteria and resources that pertain to the next managerial cycle.

Institutional research is bound up in that developmental challenge through its relationship to data systems. Our success will depend upon many factors; but chief among them as we approach the task is our ability to deal simultaneously with inputs and outcomes. We may want the latter to be the key to campus assessment and evaluation of academic activity; but the former will still be required to meet external accountability requirements, and they are likely to remain as the principal surrogates for outcome evaluation. The role of institutional research in the future, as you can well understand, will leave us very few occasions to wonder how to occupy our spare time.

FEDERAL INTERVENTION IN POSTSECONDARY EDUCATION

Ronald H. Stein
SUNY at Buffalo

When it comes to crises, administrators of institutions of postsecondary education are a lot like hurricane watchers. The question is not whether there is going to be another crisis, but rather from what direction it is going to come.

One of the current crises facing institutions of postsecondary education is federal intervention. The level that this crisis has reached today is attested to by the fact that the presidents of three leading universities (Yale, Harvard and Cornell) have, in the past two years, presented major reports addressed exclusively to this concern.

Historically, prior to 1971, institutions of postsecondary education were relatively free from outside intervention. The general feeling by all levels of the federal government and one which was frequently articulated by the federal courts was that they would not impose their wisdom on those who were better qualified. During the early period, when the government began to become involved in the institutions' affairs, they generally restricted their activities to areas where other less drastic alternatives failed to provide relief.

However, in recent years the federal government has dropped the other shoe--the sound of which has permeated all levels of institutional affairs. Equally, the scope of the intervention has cascaded from all branches of the federal government.

The purpose of this paper is to present a cursory, yet critical, study of the mushrooming effect of federal intervention in postsecondary education and a prognosis for the future.

However, before we can proceed, one critical question comes to mind. What is the explanation for the significant increase of the federal government's activity in this area? There is no single answer. As the federal government provides increased support, they feel that they have not only the right, but the obligation, to "protect" the federal dollar. However, they have not restricted their regulatory activities solely to these programs. This modus operandi has been appropriately characterized by Kingman Brewster as: "Now that I have bought the button, I have a right to design the coat."

Other reasons which must be taken into account include recent student disorders, the government's pension for social programs, identified social inequities, the growth of university systems, and the current economic conditions of the country.

One of the difficulties in dealing with the executive level is the fact that no one agency has been delegated the responsibility for enforcing policies for postsecondary education. The agency which is most frequently a focal point in this area is Health, Education and Welfare and its subsidiaries.

The Federal Interagency Committee on Education, an agency of HEW, in 1972, established a standing Subcommittee on Education and Consumer Protection. Approximately at this time, a decision was made by the Education Division of HEW that it was in the best interest of the public that they embark on an extensive program in the area of the student as consumer of education.

In July 1975, the Subcommittee on Educational Consumer Protection published a study entitled "Toward a Federal Strategy for Protection of the Consumer of Education." The report identifies a number of common malpractices believed to exist at all levels. These malpractices are enumerated as: deceptive advertising; improper recruiting; failure to disclose relevant institutional information; inferior facilities and faculty; misleading employment prospects and inequitable refund policies.

Among action steps recommended by the report is that a federal educational complaint clearinghouse be established. One of the responsibilities of this office may be to receive complaints directly from the student and initiate action for their resolution from that level.

The FICE Subcommittee on Education Consumer Protection is currently working on developing action steps for implementing the recommendations of the report including the establishment of an educational complaint system, legislation such as disclosure laws, federal student tuition insurance corporation, and requiring information to students on their rights and responsibilities.

Currently, the largest federal aid program is operated by the Veterans Administration. For the school year 1973-74, the VA spent approximately $3,000,000 to support 2,000,000 veterans in school.

One of the VA requirements is that a college or university must, within 30 days, notify them of any change in student status, including unofficial withdrawals, or the university is liable for the money the veteran receives after that change in his or her status. Large colleges and universities not only have large veteran populations but, in general, allow their students great flexibility in designing and pursuing their academic career. Therefore, if a student simply stops going to class without telling anyone, the university is still liable for monies he receives if they fail to report such change. While there may be a procedure of taking attendance and keeping track of students at small institutions, at major institutions the problem is simply impossible.

Another requirement of the VA clearly involves intrusion into the internal academic policies of the institution. The VA's policy is that they will only provide benefits to a student based upon actual contact hours, rather than credit hours. Therefore, if the university, such as the State University of New York at Buffalo at present provides 4 credit hours per course, but which involves only 3 contact hours, the VA has notified the university that they will only pay for 3 contact hours. The question of how much a course is worth and what constitutes a contact hour or credit hour are decisions which should be made by the faculty and not by the VA.

This results in a tremendous output of man hours and computer time in order to conform to what many see as unreasonable policies by the VA which directly intrude into the academic program of the institution. However, failure to do so can have catastrophic effects on the institution.

Recently, the State University of New York College at Farmingdale received a bill for $92,000 as their liability for failure to report within the 30-day period change in students' status, while Hostos C. C. in CCNY reputedly received a bill for $628,000.

The State University system in Colorado has recently threatened to pull out of the VA program because they cannot meet the obligations imposed upon them. Again, as in other situations, both the institutions and the students suffer because of the byzantine federal rules.

The Immigration and Naturalization Service of the United States Department of Justice has extensive regulations and exercises rigid control over non-U.S. citizens who come to the United States for education purposes. These federal statutes affect both the university and the student and amount to a paperwork jungle.

Recent studies in the area have concluded that the institution must generate an average of 40 pieces of paper for every foreign student--in addition to those generated for other students. If you take a not uncommon situation where a student requests to extend their stay in this country upon completion of their course of study, 8 separate forms must be submitted by the institution and this assumes there is no other complication.

Last, it is important to note that the INS regulations make no distinction between students who are in institutions of higher education and those undertaking a course such as cosmotology or blacksmithing.

A number of other programs need mentioning. First, in the past few years the federal government has been active in a number of programs ensuring equal employment opportunity and affirmative action. While there is no question in anyone's mind of the need, one must question whether the approach taken by the federal government represents the best avenue for achieving these goals.

The problem of hiring minority faculty members is obvious. Universities are producing very few minority Ph.D's. Those that are produced are often stolen from colleges and universities by offers of very lucrative jobs from industry and government, which is trying to solve the same problem. The same case may be made for women who are only recently entering the job market in large numbers.

However, the time is such that institutions are retrenching faculty members rather than hiring new. Part of this dilemma is created by the government's own regulations which require that universities must go through extensive search procedures and affirmative action justifications before they can bring a faculty member on board. In this rapidly declining educational market, any delay, especially one from six weeks to two months, means that lines may be frozen, sequestered, or even eliminated.

Part of this economic crisis represents the cost to the institution for complying with the federal programs. Cornell University estimates their cost in complying with the equal employment and affirmative action program alone to run several hundred thousand dollars a year. How many blacks, Spanish-speaking Americans or women could be hired for $200,000 a year?

In 1974 the conservative senator from New York, James Buckley, introduced an amendment from the floor to the Educational Appropriations Act of 1974. The amendment passed without committee consideration, hearings or even much floor debate. The amendment, of original merit, was designed to open up for parental scrutiny the permanent record cards and files of elementary and secondary schools. It has been said by some that it was only an afterthought to expand the amendment to cover postsecondary educational institutions.

This amendment, known as the Family Educational Rights and Privacy Act of 1974, was the source of a tremendous uproar by college and university officials throughout the country. Among other deficiencies, as originally written, the amendment would have opened up to student scrutiny all matters contained in his educational record, including letters of recommendation solicited under the umbrella of confidentiality. An immediate groundswell of opposition resulted in the act being amended in January of 1975.

Even as amended, the Act strikes deeply into the daily operations of the university. Presently, the student has the right of access to any recommendation which is part of their educational record unless they elect to waive access. It is the opinion of some that the consequence of this act has been for recommendations to take on such a bland character. Some colleges and universities have considered no longer accepting them and make decisions entirely upon test scores. A further fallout of this amendment has been for increased numbers of university faculty to communicate their opinion of prospective candidates by telephone, rather than reduce their opinions to writing which the student has the right to scrutinize and challenge. Recommendations of this nature may have a far more insidious effect on a student's career than written recommendations. The law requires extensive and costly notification and record-keeping on the part of the institution. Numerous forms had to be developed and administered which ultimately translates into administrative costs at a time when these institutions are already hard-pressed to maintain and support staff. Schools must formulate and make available to students a written policy statement listing the procedures developed for students who wish to see their educational records, listing of the type and locations of records maintained by the school and the titles and addresses of the school officials responsible for them. The school is required to inform students annually of their rights under the Act.

Also, under the law, the student has the right to challenge any record which the student believes to be inaccurate or misleading. However, this does not allow a student the right to challenge a particular grade, but only to a determination that the grade recorded does actually correspond to the grade reported by the faculty member.

The Family Educational Rights and Privacy Act of 1974 will have far-reaching effects on the future record-keeping procedures of institutions of postsecondary education. There is no question in the minds of many administrators that there are parts of the Act which have had a very positive effect and resulted in reforms which were long overdue. Conversely, there are shortcomings of the law which might have been avoided if Congress would have taken the time to conduct hearings to gain sufficient knowledge before intruding into an area which is so internal to the university and beyond their level of competency.

Current congressional action continues to reflect the belief that all areas of university affairs are germane to "federal comment." Senator Javits of New York had recently proposed an amendment to the Higher Education Act of 1975 known as the Student Consumer Information Act of 1976, which was signed into law by President Ford on October 12, 1976. This law proposes that, in exchange for $10 per academic year for each student who receives a Basic Opportunity Grant and/or Guaranteed Student Loan, the University must provide to each prospective and currently enrolled student "consumer information" about aid. Among the information required to be provided includes financial aid available, the means for applying for such aid, the standards used by the institution in awarding the aid, the methods by which the assistance is distributed among the students, the cost of attendance, and the institution's refund policy.

Finally, as a condition of receiving the funds, the institution must provide, where full-time enrollment justifies it, a full-time person or group to students and prospective students in obtaining this information.

The intervention of the federal judiciaries into the internal workings of institutions of postsecondary education has generally been quite narrow in scope. Prior to 1961, we find little, if any, activity by the federal judiciaries in this area. Post-1961, what activity has occurred has been limited primarily to requiring the elements of due process in student disciplinary cases at public institutions of higher education.

Judicial intervention in other areas has generally been excluded, based upon the rule of judicial non-intervention in scholastic affairs which states that: "In matters of scholarship, the school authorities are uniquely qualified by training and experience to judge the qualification of a student, and efficiency of instruction depends in no small degree upon the school faculty's freedom from interference from other non-educational tribunals."[1]

However, presently there is a series of developments at this level which has raised the eyebrows of university administrators. This area is a question of "reverse discrimination." The case involves a student by the name of DeFunis who applied to the law school of the University of Washington. He was denied admission. He maintained the denial was improper because he was discriminated against because he was white. He argued that the law school admitted minority students who did not have to go through the same procedure and, in fact, if they would have, would have been denied admission. He claimed that his constitutional right to equal protection of the law was being denied because of this double admission standard. After a series of state court hearings, the matter was finally heard by the United States Supreme Court. In a 5 to 4 decision, the court refused to rule on the merits of the case, but stated that, since the student was currently enrolled in the school (the results of a restraining order issued pending the outcome of the case) and was scheduled to graduate, that the case was now moot.

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[1] Connelly v. University of Vermont and State Agricultural College, 244 F. Supp 156 (1965)

This matter may soon be resolved. Recently, the California Supreme Court ruled the admission quota for minorities at the University of California at Davis Medical School unconstitutional. It is the best guess of knowledgeable academic officials that future developments will be in the direction of the U.S. Supreme Court declaring unconstitutional these special-preference admission programs. Until this matter is resolved, the fate of these special-admission programs remains in limbo.

An interesting sidelight to this problem also rises. A number of minority students who have failed to succeed in these special programs have gone to court and argued that, since the university accepted them, knowing their deficiencies, the college and university have the responsibility to make up their deficiencies and insure that they graduate from the program.

While no one is denying that the federal involvement in postsecondary educational affairs is motivated by the best of intentions, the ramifications of these regulations and programs have had a negative effect on the very ability of the institution to function. These programs, in general (with the Javits bill being one of the rare exceptions), demonstrate a failure on the part of the federal government to balance the notion of autonomy with accountability.

First, the sheer additional costs which must be borne by institutions to administer the programs is staggering. According to a study done by the American Council of Education, the costs of administering 12 federally mandated social programs, including social security taxes, for the period of 1965 to 1975 at the University of Illinois at Urbana went from $438,470 in 1965-66 to $1,302,545 in 1974-75. These costs are even more staggering at Georgetown University where costs went from $110,736 in 1965-66 to $3,603,243 in 1974-75. These costs affect all levels of postsecondary education. Miami-Dade Community College costs went from $1,263 in 1968-69 to $180,764 in 1974-75.

What makes these costs more abusive is the fact that they have risen at a time when institutions of postsecondary education throughout the country are facing one of the greatest financial crises. It should be obvious to the federal government that universities and colleges have only two options to meet the cost of these federally mandated programs--the first to raise tuition or the second to reduce staff. Confronted with the recent increases in tuition which were necessitated by the rapid rate of inflation and a leveling off or even declining enrollment, tuition increases will soon reach the point of diminishing returns. Therefore, the only avenue open to these institutions will be to reduce their academic programs and cut back on faculty and staff. However, since many recent personnel appointments are minorities and women, applying the law of last hired first fired, which has been recently upheld in a number of federal courts, federal intervention has created a situation which makes it extremely difficult, if not impossible, for the universities and colleges to conform to federally mandated programs.

Second, many of these federal programs, which institutions of postsecondary education are now being forced to comply with, were originally drafted for industry. It is only recently that postsecondary educational institutions have been forced to comply. However, most of the laws have not been modified to account for the diversity of these species. The problem is much like trying to force a square peg into a round hole. Examples of these problems have been illustrated in a recent Newsweek article entitled "Red Tape Blues" (August 30, 1976). The article indicates that the University of Illinois may have to spend $557,000 in order to bring an elevated walkway in a Chicago circle campus into conformance. It seems that its banisters, which are made out of solid granite slabs, are five inches short of the 42-inch standard required by OSHA. The article also points out that Stanford University was recently informed that their 6,000 chrome-plated fire extinguishers were in violation of federal regulation--that they be colored red. "Exasperated officials figured out a way to comply; they wrapped the offending fixtures in red tape."[2]

The Environmental Protection Agency emission standards are estimated to add approximately five million dollars to the cost of Cornell's upgrading their central heating system. Frustration like this can be cited by college and university presidents throughout the country.

Third, it is not rare to find that a number of government agencies have responsibility for enforcing the same federal policy: "In the field of equal employment opportunity, for example, authority has been shared by the

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[2] Newsweek, August 30, 1976, p. 77

Department of Labor; Department of HEW; Equal Employment Opportunity Commission; and even the IRS.[3] Such a proliferated bureaucracy makes it extremely difficult, if not impossible, for one to know what agency to approach with what question. Even when one does get an answer, there is no assurance that another agency is not giving a different answer to the same question.

Finally, we come to the question of where it is going to stop. The answer is simple--no one knows. Even as we meet today, federal bureaucracies are drawing up new regulations, congressional legislators are drafting new laws, and federal judges are issuing new decisions further exacerbating the problems we have already discussed. The solution is obvious--somehow, somewhere, someone is going to have to stop and take a look at the problem. If the past track record of the federal government is any reflection of the ultimate probability of arriving at a solution to this problem, the future outlook is indeed bleak.

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[3] Derrick C. Bok, The President's Report, 1974-1975

EXCERPTS FROM KEYNOTE ADDRESS

Dorothy Goodwin
Connecticut House of Representatives

I think it is clear from what has been said so far this evening, that Institutional Research still suffers from an identity crisis - just as it did way back in 1966 when I first attended a meeting on the subject in Burlington, Vermont. The more it changes the more it remains the same. At this time, my (unsolicited) advice to you is not to worry. Do your own thing, respond to your own boss's needs, and carry on. It does not matter that you do not all do the same thing, or that you cannot define your field uniformly.

When George Beatty first asked me to speak to you, I wrote him that I could cover the topic, "rational decision making and political realities: the role of institutional research," in four words: "Legislators don't (can't?) read." That is not as unhelpful a finding as it might seem. What it really says is that the spoken word will probably have to carry your message to the legislature, rather than the written word. In a state like Connecticut, where the legislature meets five months during odd-numbered years, and three months during even-numbered years - with constitutional deadlines forcing decisions on budgets within those periods - where we have no offices, no desks, no telephones, no file cabinets, no clerical help, and not much pay, every piece of paper that possibly can, finds its way as quickly as it can into the wastebasket - usually unread.

So the spoken word, supplemented by an occasional table or visual display, must be sharp, clear, concise, objective, accurate, low key, and unimpassioned. Legislators range in intellectual skills from the incredibly dumb to the very bright. But even the dumbest knows what a lobbyist is, and that you fall into that class. And even the densest can distinguish between rhetoric and reason.

This was first borne in forcefully on me one night during a perfectly dreadful Finance Committee hearing in the Hall of the House. Lined up against the back wall of the Hall were perhaps 100 men and women, all carrying placards containing variations on the theme "Support Vocational-Technical Education."

Speaker after speaker after speaker produced impassioned diatribes against taxes - all taxes - every kind of tax in every kind of circumstance, and every time a particularly moving statement was made urging cutting of expenditures, all the vocational-technical education advocates cheered.

After about three-quarters of an hour of this, I leaned over to the Committee Chairman and said, "Isn't it wonderful how quickly one becomes inured to eloquence."

And it's true. People often ask me how to impress the legislature. Should they mobilize 500 people to march on the Capitol? Should they all write identical letters? Should they all make identical speeches at hearings?

Really, none of these things. Legislative hearings exemplify Parkinson's Law as well as almost anything I know: the more trivial the point the greater the crowd of speakers, the more they repeat each other, and the less effective they are. Every person who wishes to be heard at a hearing is entitled to that right, and though a time limit of, say, five minutes per speaker can be set, 100 speakers at five minutes each is more than eight hours. If we start at 7:30 p.m., that means we finish sometime around 3:30 in the morning. Legislators have an incredible capacity for boredom, but it is not infinite, and you do better with us if you do not really search for that finite limit.

Seriously, though, most legislators want to do a responsible job. Most take their duties very seriously, and are attentive and hardworking, and will listen if you tell them what they need to know to make a rational decision. You must remember, though, that they are subject to extraordinary pulls and tugs on them, and that their basic responsibility is to adjudicate the claims for their attention and acquiescence fairly and equitably, without favor. You represent only one set of claimants, and much as I believe in the importance of public higher education, there are claims involving matters of life and death and sanity and safety that perhaps have to come first.

How do we resolve all of these conflicting forces? It's not easy to say. For one thing, I'm sure we all do it differently. People's perceptions of the right way to resolve such conflicts tend to polarize around two extremes: the idealists who say "Never compromise. Vote your conscience on every issue," and the party loyalists who think that's just silly, who scorn the issue-oriented politican, and who feel very deeply that when in doubt you should vote the party line.

I think the hardest psychological problem I faced was treading the narrow line between integrity and rigidity on the one hand, and integrity and party loyalty on the other. The idealists are too simplistic. If I never compromised it would mean I thought I was God and had all the answers. It would probably also mean that I could not psychologically afford the luxury of listening to the reasoning and arguments of others. It would also tend to mean that I saw each issue in total isolation, to be voted on as if it had no substantive relation to any other issue, and no procedural relation to my own role in the House. At the same time, I'm simply not capable of always taking orders in matters of conscience, and sometimes I have to conclude that the party is wrong.

So I spend much of my time in dutch with someone. And this itself is not an unimportant matter. One has an absolute responsibility in that setting to maximize one's own influence, so that in the long run when that influence is needed, it can make itself felt. This means you don't bring out the big guns on every issue - that you gauge the ammunition to the size of the target. It means that when you do bring the big guns out people will listen because you have not wasted their time and emotional energies on the unimportant. It means that you do not tilt at every windmill. Some of the finest people in the legislature do just that - and after a while their colleagues just shrug and say "Jack is at it again."

So one is constantly making choices - intellectual, moral, strategic - seldom sure of what is right, often in over the head in one or more of the thousands of kinds of issues on which one is supposed to be an instant expert - and cannot possibly be one - hoping that on balance one is more right than wrong. And the first thing you learn is that, indeed, you are not always right, and neither is anyone else. So we share a kind of humility that is essential to getting the job done.

All this is background to an understanding of how the legislature as a whole goes about its business. We depend primarily on a committee structure. In Connecticut in the 1975-1976 sessions, there were 22 committees, each with from three to perhaps 10 subcommittees. These are joint committees, each with a Senate and a House Chairperson. No official business can be transacted unless both houses are represented at the Committee meeting.

Bills come from many sources. The most important are those representing unfinished business from previous sessions, or technical corrections to statutes already on the books. The Committees themselves develop many pieces of legislation. In terms of numbers, however, most bills are introduced by individual committee members or, indeed, by any member or members of the legislature. They first are drafted in proposed form, with nothing but a title and a statement of purpose. As many as 10 bills almost identical in proposed form may crop up because individual legislators have had similar ideas.

The Committees screen these proposed bills, combining those that are similar, and making a decision as to whether to request full drafting in legal language, or to "box," which means, quite literally, "to put in the box," i.e., to kill, or at least suspend further action.

Once drafted, the bill returns to Committee for full discussion. Before final action by Committee, it must go to hearing. Some important bills go to hearing at six or seven locations all over the state. Following hearing, the bill may be amended, voted down, or voted out of committee. If the latter, the bill then goes for debate to the floor of the House of origin - if introduced by a Senator, to the Senate, or if introduced by a Representative, to the House.

I'm assuming that the debate process in other states is like that in Connecticut, but if you have never seen it, you might be interested in how it goes forward.

First, we use Mason's Rules, not Roberts' Rules, which confused an old University Senate parliamentarian like me rather considerably at first. The most important differences have to do with resolving conflicts between the two Houses, but the most conspicuous differences affect the process of debate itself. First, there is no seconding. The House Clerk calls the next bill on the Calendar. The Speaker recognizes the person responsible for introducing the bill, who moves "acceptance of the Joint Committee's favorable report and passage of the bill," and the matter is on the Floor.

Second, there is no moving of the question. Debate will go on as long as anyone still wants to talk, and that can be a very long time, indeed, in some cases. The only limitation is on the number of times an individual may rise and speak on a given bill. He speaks once. If he seeks recognition again, he rises, saying "Mr. Speaker, for the second time." He may not speak a third time without the permission of the full House - a single objection can prevent his speaking again. Courtesy requires that you do not ask to speak a third time except in extremis, and courtesy then requires that you be granted the right. I don't know what would happen if you sought a fourth chance. I guess the Speaker would simply not recognize you, and since your microphone won't work unless he recognizes you, I guess that is sufficient.

After the proponent of the bill has introduced it, the Speaker will then say "Will you remark." To which the required response is "Yes, Mr. Speaker I will," or possibly, "Thank you, Mr. Speaker." He then explains the bill in summary form and urges its passage. The formal debate is then underway.

It may proceed as a formal debate, with pros and cons. Or it may proceed as a series of questions addressed by members of the House to the proponent. In all cases, the would-be debater signals the Speaker by pressing a button, rising, and saying in the microphone, "Mr. Speaker, Mr. Speaker," until someone is recognized. There follows a stylized, ritual dance, always choreographed in the identical manner.

"Thank you, Mr. Speaker. Through you, Mr. Speaker, a question to the proponent of the bill."

"Please frame your question."

"Through you, Mr. Speaker, my question is...."

"Mr. ___________, do you care to respond?"

"Yes, Mr. Speaker, I do." (Or maybe, "I do not," which closes the question).

"Please proceed."

"Thank you, Mr. Speaker, my answer is...."

"Through you, Mr. Speaker, another question to the proponent of the bill."

"Please frame your question."

"Through you, Mr. Speaker, my question is...." and so on.

This kind of interchange can have two purposes. It can be simply an interchange of genuinely sought information, and in many cases it results in real clarification of a complex issue. Or it can be a form of court-room cross-examination, designed to lead the person being questioned down the garden path into a trap, which will finally be sprung. During the first session, the court-room lawyers on the other side of the aisle used this device with great effect to embarrass those of us new to the game - until one day I discovered quite by accident that the way to defuse the questioner was to answer the question with another question. This threw my opponent off balance, and he ended up sitting down in some confusion. No one tried it after that.

What is the purpose of this fancy charade? Its purpose is very real. One, it preserves order. You cannot all talk at once if you have to wait for recognition to get your "mike" turned on. Two, it makes it impossible to lose your temper. Issues debated on the floor include some of the most emotional and most deeply felt that people can discuss, and untrammelled debate would often be explosive. But we cannot afford to explode. We cannot afford to demean the proceedings of the Chamber. Most of all we cannot afford to demean each other. It is absolutely imperative, no matter how profoundly we disagree, that we maintain working relations with each other. This means retaining the semblance of mutual respect. And a funny thing happens when you retain the semblance. Somehow the substance suvives, too.

And so the minuet continues its tedious, time-consuming, distracting, essential way, and we get our business done. And we build a sense of real affection and collegiality with the most surprising people that permits us to keep our minds focussed on our real objectives instead of just each other.

I've lived a long time, now, in many places and many settings and with many different kinds of people. There have been dry stretches and wonderful stretches. But the legislative experience is unique. I can hardly think of an adjective that does not apply: boring, tedious, frustrating, irritating, dismaying, humiliating, exciting, exhilerating, demeaning, ennobling. It is a builder of ego, a destroyer of ego. And above all, it is an education, infinitely varied, endlessly fascinating, always enlightening, always mind-stretching. I would not have missed it for anything.

MANAGEMENT INFORMATION SYSTEMS IN HIGHER EDUCATION AND THEIR USE WITH RESPECT TO INSTITUTIONAL RESEARCH

Jerry Wayne Brown and J. Barton Luedeke
Rider College

The technical capability for developing management information systems within higher education has existed for some years. Software and hardware adequate to the task have been available. Appropriate general theories of management have been articulated. And yet, among the more than 3,000 institutions of higher education, relatively few have developed, or are in the process of developing, comprehensive management information systems. This slow growth perplexes and frustrates many persons competent in software and hardware design, in systems theory, and in management applications. This presentation attempts to reveal several myths pertaining to MIS development, to outline some key requirements for that development, and to demonstrate some important implications for institutional research.

Some Myths Surrounding Management Information Systems and Their Use in Institutions of Higher Education

Myth 1 - The application of management approaches to the operation of colleges and universities will undermine the quality of those institutions. This assumption is rejected on the grounds that there is nothing inherent in the application of management approaches to destroy the quality and integrity of institutions of higher education. To the contrary, those institutions face a set of constraints and opportunities that will require much improved operating capability over the remainder of this century. The appropriate application of management approaches may well be the single best hope for protecting quality programs in higher education and enabling them to prosper in a period of declining resources.

Myth 2 - The persons best equipped to engage in analysis, planning, and overall decision making in colleges and universities are those trained in one of the academic disciplines. "Administrator" has become the generic term for categorizing those who make decisions within academe. Behind this nomenclature lies an authentic tradition of amateurism which hallows a dean, a president, or a provost who arises from the faculty ranks, whose expertise lies in an academic discipline, and who is expected to return to the faculty ranks after some period of administrative service. While in no way discounting the abilities of the many faculty members well prepared in their respective disciplines, little basis can be found for assuming that knowledge in a particular field is extendable to the many skills now needed in directing the activities of a complex organization. The tradition of administrative amateurism no longer serves higher education effectively and must be replaced by a tradition that values the abilities possessed by those willing to make a long term professional commitment. Professional careers directed to the mastery of rational decision-making techniques within higher education are becoming more common but have by no means replaced the traditions alluded to above. Many administrators, particularly those in academic administration, will continue to regard administrative service as a term of duty within a teaching-research career and those who select administrators will frequently favor disciplinary doctorates along with teaching and publication as important qualifications for administrative office.

The logical extensions of this kind of amateurism may be found in the processes and relationships characterized under the rubrics of "collegiality" and "academic governance." Both of these terms connote more than they denote and the connotations frequently corrode the possibilities of management-like activity. The connotation of collegiality usually separates the profession of teaching and research from other professions on campus and places it in higher esteem. Simultaneously, it assumes the professional expertise in teaching and research in an academic discipline automatically extends to the profession of decision making on the campus. This assumption of automatic extension enriches the connotation of "academic governance." In connotation, academic governance indicates a process by which decisions arise from a state of consensus informed by extended expertise derived from disciplinary training. While this picture may seem caricatured, the pervasiveness of charges against campus decision makers based upon "non-collegiality" or upon charges of violations of the due process of academic governance seem significant.

Myth 3 - Management information systems if effectively designed, will more or less automatically improve the quality of decision making within the organization. This assumption is rejected on the grounds that the extension of management information systems into higher education will proceed no more rapidly than the will to manage develops within these institutions. The phrase maker who coined the phrase, "Management Information System" had access to a good mint. Of these three, the word "management" is the most frequently neglected. Research literature and other available resources have focused much more attention on data and information and on information systems and data organization than on management theory and practice in higher education. A management information system is of little utility without a designated and organized group of people who are willing and able to manage.

Myth 4 - Persons with decision-making responsibility want to be accountable and welcome the improved quality of information that a good management information system can normally provide. The fallacy here lies in the assumption that all persons with decision-making responsibility really desire to be accountable. The very collection of data into systematic information for the use of management becomes a powerful tool in holding managers accountable for their decisions and the consequences of those decisions.

The same limitations expressed with regard to accountability can be extended to the concept of decision-making freedom. It is normally assumed that a decision maker would like to be relatively unconstrained in his decision-making options but perhaps that is not the case. There may well be circumstances in which multiple alternatives are not really desired. Some decision makers would like to behave as if they were absolutely constrained or absolutely unconstrained. The former might be characterized by the statement, "Just tell me what to do and don't bludgeon me with information about why it must be done." The latter might be characterized by the comment, "Don't tell me resources are inadequate, it's your job to find the resources."

The limitations can further be extended to the notion of priority setting among competing goals and objectives. Good management information systems tend to illumine undesirable as well as desirable consequences among alternative courses of action. Some alternatives may have positive effects in terms of one organizational goal but negative effects in terms of others. Rarely, if ever, does a course of action have positive benefits for all goals. Consequently, managers informed by good systems make decisions within ambiguity and attempt to find the best fit. Often, one robs Peter to pay Paul. In effect, decision makers seek to implement a decision which is "less wrong" rather than one which is "right." Tolerance of ambiguity has become a rare element in our society and one may suppose that many persons will resist tools and techniques which apparently deprive them of the privilege of defending decisions because those decisions are "right."

Myth 5 - Institutions of higher education are relatively simple organizations and thus, there is little need for the sophisticated capabilities of a good management information system. This assumption is rejected on the grounds that it is based primarily on the patterns of cash flow. In that sense, institutions of higher education may appear relatively simple compared to the banking enterprise, the automobile industry, the aerospace industry, or the health and welfare enterprise. Cash flow represents only one measure of complexity. If one were to compare the alternative ways of delivering a baccalaureate degree in history along with the myriad of services supporting that delivery to the alternate ways of delivering a new automobile, one might well conclude that institutions of higher learning comprehend a higher degree of complexity in terms of audience, options, and other features. Many institutions of higher education are organizationally complex and require information systems suitable to their needs.

Myth 6 - Management information systems are of principal value in supporting the day-to-day operations of the organization. This assumption is rejected on the grounds that complex management information systems have great potential benefit as tools in support of modeling and forecasting activities. Managers must be involved in the exploration and definition of alternative courses of action within as broad a spectrum as possible. This managerial activity includes the modeled iteration of various alternatives in order to explore the possible results and consequences of each. Some may prefer to have externally imposed limitations placed upon the number of alternatives that might be considered but this is a human problem and should not be considered a shortcoming of a good management information system. Information systems that serve only the day-to-day operations and do not encompass planning and forecasting capabilities, are not realizing their full potential.

Myth 7 - Useful information for management purposes can be readily developed if a large enough pool of discrete pieces of data can be accumulated. There is some tendency to feel that if enough data can be collected, the answers to most decision-making questions will become apparent. Unfortunately, this fails to recognize the important need to convert data to information--a process that normally does not occur by chance. A good management information system when coupled with intelligent use by a data base manager can be of great help in this important conversion process. Decision makers who claim that they are stymied by an avalanche of data, in most cases, reflect a failure in the process of converting data to information. Not too much data but rather too little conversion to information stymies decision makers.

Myth 8 - An "information system" that draws from multiple data bases containing like data can produce consistent and accurate information if the persons responsible for those data bases remain in regular contact. This assumption is rejected on the grounds that in most cases, an information system with a number of components will serve most effectively if the data that drives the system is obtained from a single data base. This does not mean that the data bases must all be maintained in a single location but rather that a particular data element be the responsibility of a clearly identified manager and that that manager be responsible for the entry and maintenance of the particular data in question. The problem arises when something attempting to pass as an information system is really a composite of stand-alone systems. In that instance, each data base manager may well be including data elements similar to those maintained in other bases but with different data in the base. Attempts to achieve coherence of information derived from these different data bases will likely prove unsuccessful.

Myth 9 - If the management information system is computer based, a person in the Computer Center should be the principal data base manager. While there may be situations in which this assumption is correct, a good argument can be made for placing the responsibility for the respective data bases in the hands of the institutional manager responsible for the collection and use of the data. For instance, in a college or university, a Registrar, a Director of Admissions, a Bursar, a Housing Office Director, a person responsible for staff personnel records, and a variety of others may prove to be the best choices for data base managers. These are the people who collect the data, who are responsible for updating the data, and who are in general best informed about what the data really mean. The role of the Computer Center as a technical support unit should not be minimized but decisions concerning the data in these bases should be made by the data base managers in the respective units responsible for them.

Myth 10 - Different data bases are normally needed for the support of analytical and planning purposes than are needed for the support of day-to-day operations. This assumption is rejected on the grounds that the best sources of information for analytical and planning purposes are the same as those used for day-to-day operations. While different approaches are clearly needed with respect to the use of the data for analytical and planning purposes, there appears to be no reason why the same data bases that support the day-to-day operating activities cannot also support these other areas of institutional planning and decision making.

Some Important Concepts in Developing a Management Information System

In developing a management information system, one must be aware of each of the three major concepts implied by the name--management, information, and system. There is some tendency to slip into the mistake of thinking of a management information system as a singular concept. Rather, there are three major concepts embedded in the name and a true management information system will embrace each of them.

The first concept has to do with management activity. It is entirely possible to envision the creation of an information system that is not designed to support management activity. While it might be entirely effective in meeting some other need, it could not truly be called a management information system. It is difficult to imagine an effective management information system in a context where management information is not valued. It was earlier stated that the extension of management information systems in higher education will proceed no more rapidly than the will to manage develops within those institutions. The availability of hardware, software, and a well-trained supporting staff represents a much less significant impediment to the effective use of management information systems than does the absence of a will to manage in many institutions of higher education. Until such a will to manage exists, much of the effort in developing a good management information system will have been wasted.

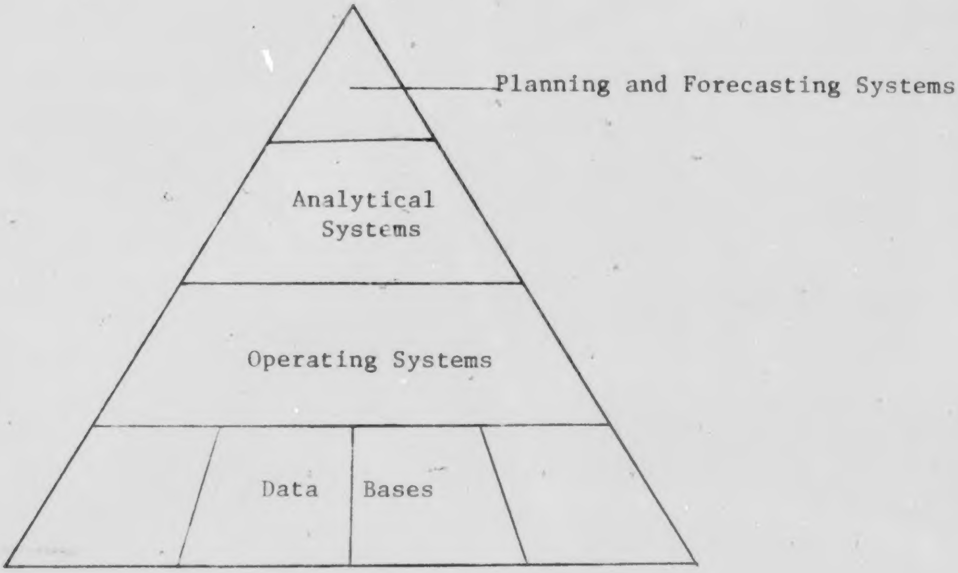
The second major concept revolves around the notion of information. Again, as stated earlier, a distinction must be made between data and information. Some systems posing as management information systems might more appropriately be called data systems. These systems do not possess the capability of helping to convert data into information and merely produce lengthy lists of "raw" data. While they may improve the data formating capabilities of an organization, they add relatively little if any to the processes by which data are converted to information. If this important conversion function is absent, a true management information system cannot be said to exist.

The third major concept revolves around the notion of system. While normally a fully integrated set of data bases is not required, compatible data bases consisting of commonly defined data elements are essential. Stand-alone data bases often reflect the existence of stand-alone systems and stand-alone managers. Good decision making within an institution will normally be impeded by the existence of stand-alone managers, particularly if they make decisions based on information contrary to that held by others within the organization. Thus, the idea of a systematic approach to the creation and dispersion of information within the organization gains considerable importance. Management information without the controls imposed by a systematic approach to its collection and dispersion is of somewhat limited value.

Thus, those charged with the development of a management information system must be conscious of the multi-faceted meaning associated with the term. Only when there is a systematic approach to the retention of data and the conversion of data to information in a context in which management-like activity is occurring can a management information system be said to exist and can it hope to realize its full potential.

Information uses can be categorized hierarchically as indicated in the diagram below. In this scheme, information serves three broad purposes. While the distinctions between the hierarchical divisions may blur somewhat in practice, an institution engaged in the planning of a management information system might be well advised to keep the three categories of use conceptually separate. By doing so, it will be somewhat easier to distinguish the specific functions to be supported by the management information system.

Within one hierarchical division, the management information system provides information to support the day-to-day functional activities of the institution. For example, class rosters, student account records, lists of applicants contacted by the Admissions Office, and the current status of occupancy in residence halls are of this type. In some cases the information will exist in hard copy form while in others it may be stored in computer files to be accessed by means of a video terminal. With respect to this scheme, the means by which the information is conveyed to the user is of less importance than the category of use. Notice that information within this category primarily supports the ongoing functions of the institution.



A second hierarchical category includes information produced to support the analytical functions of the institution. Often, this information is in somewhat more aggregated form than that produced for the operating type activities and may include comparative information prepared on a longitudinal basis. Information to support activities in this category is often composed of treated data from several different sources. For instance, unit cost analysis within instructional units, may well depend upon information from a student records base, from a staff personnel base, and from a financial records base. Analytical activity frequently deals with questions having to do with where the institution stands at the present time, perhaps in relation to its past performance.

The third hierarchical division requires information pertaining to the planning and forecasting functions. This differs to some extent from the analytical function in that it is largely forward looking. Obviously, it will often be based on analytical studies but the emphasis is on projection rather than analysis of the present status. Again, information may be drawn from a number of sources and may be manipulated through the use of planning models of varying degrees of sophistication. Persons with planning responsibilities become heavily dependent upon the data base managers in the operating units.

To summarize, the operating systems are driven by the data bases and are used to process transactions and produce reports pertaining to the basic management functions of the institution. Managers at the operating level are frequently interdependent and that interdependence must be reflected in the design of the management information system. While, for example, the Registrar may be responsible for maintaining a student records data base, other operating managers within the institution may have need for information from that base. They then become dependent upon the Registrar for support with respect to their own responsibilities. Generally speaking, this interdependence will have a beneficial impact on the logic underlying the various operating procedures.

Both the data bases and the operating systems must be designed to be supportive of the analytical and the planning and forecasting systems. These activities are likely to be most effective in those circumstances in which they are supported by the same data used at the operating level. This is not, of course, meant to suggest that additional planning and modeling devices should not be used but rather that when possible, their support should derive from existing sources within the information hierarchy. In terms of personnel, those with planning responsibilities depend heavily upon those with operational responsibilities.

Much of the foregoing speaks as much to the notion of system as it does to the notion of information use hierarchies. An information use hierarchy of the kind outlined above could not possibly function without the systematic organization of information sources. If each operating manager were to maintain a data base that was entirely independent of the data bases maintained by others, the quality of information available for analytical and for planning and forecasting purposes would almost surely be considerably diminished. By building a structure in which each operating manager is part of a broader system, controls are imposed that have the capacity for aiding in the conversion of data to information and for greatly improving the quality of information available for analytical and for planning and forecasting uses.

Integrating the Institutional Research Function

Various models exist in institutions of higher education for accomplishing the institutional research needs of the organization. This paper does not intend to suggest that one model is necessarily better than another. Organizational circumstances may well dictate particular models as needed. However, the paper does intend to suggest one model that differs somewhat from the traditional notion of an office of institutional research.

It does appear possible to create a situation in which much of the institutional research is conducted either by an operating manager or by an individual with analytical and planning responsibilities. The research conducted by the operating manager normally is directed to that operating unit or is based on information supplied largely by that unit. Research of a broader institutional nature or having significant planning implications is typically conducted by a "central manager" although frequently with the support of one or more operating managers.

This means in effect that the Chief Student Personnel Officer, the Registrar, the Director of Admissions, and a host of others become institutional researchers and have that function embedded within their responsibilities. This requires, of course, that they begin to think of themselves as institutional researchers and that they assign this set of activities a high enough priority that they not be ignored as a result of the day-to-day pressures.

There are some obvious advantages as well as disadvantages to this particular model. One clear disadvantage is the one alluded to above. If a formally constituted Office of Institutional Research exists, the question of whether or not to do institutional research becomes moot. In that situation, the question is one of priorities with respect to the institutional research to be done. Presumably the staff can be committed to research activities and the nature of the research to be undertaken will depend upon the judgment of the person establishing priorities for the office.

Embedding much of the research within other functional areas may lead to ignoring research in lieu of other seemingly more pressing demands. However, in an institution committed to a management approach, demands for information to support the various planning and operational activities mitigates that danger. Institutional research no longer becomes an expendable function but rather becomes a necessary support to the operation of the institution.

Another potential disadvantage concerns charging people not trained specifically as researchers with responsibility for conducting institutional research. This can lead to methodological and design problems but generally speaking, operational managers are perfectly capable of conducting the kind of research needed within their own operating units. In those situations in which they are supporting the research activities in the analytical or planning areas, they will be working with a person presumably trained in research methodologies. This does not appear to be a serious disadvantage.

The model entails clear advantages. For example, institutional research is almost always conducted in response to real institutional needs. This statement does not intend to indict the work of institutional research offices but if an institutional research staff exists, it will create the necessary projects to maintain a full work load whether they are of greatest institutional significance or not. Research undertaken within this model tends to mean that projects of greatest importance become projects actually accomplished.

It is also particularly useful to have a cadre of individuals throughout the institution who are sympathetic to and appreciative of the need for meaningful institutional research. It no longer becomes someone else's job to do the institutional research but rather, becomes in part, the function of every operating manager. Stated again, institutional research becomes a very regular and integral part of the overall operating activity of the institution.

A clear tie between the management information system and the institutional research function becomes obvious. Operating managers are both data base managers and institutional researchers and as such, have ready access to much of the information needed for the conduct of institutional research. By virtue of that fact, they know the available information well and are often able to capitalize on the special expertise they have with respect to the data base. Helpful comments, for example, with respect to a forecasting study may be made by a Registrar upon whose data base a part of the study will be dependent. The Registrar's knowledge of the strengths and limitations of his base can be very crucial in the design of the forecasting study to be undertaken.

The net result is to spread the institutional research function among a number of people. This seems to have the effect of increasing the significance of the institutional research activity and incorporating it as a central activity in the management function of the institution. In this scheme, operational managers and "central managers" become heavily interdependent with respect to their various responsibilities and if they perform effectively, the management capabilities of the institution are enhanced.

Summary

This paper has dealt with a number of myths surrounding the development and use of a management information system, with some important concepts relating to the creation of a management information system, and with the integration of the institutional research function into the management scheme of the organization. The paper is based on the notion that a management approach can be of considerable benefit to institutions of higher education and that if such an approach is to be taken, the development and effective use of a management information system will be of considerable importance. If a management approach is adopted and if a management information system is created to support the new approach, there are considerable potential implications for the institutional research function. Within a management approach, the institutional research function becomes central to many of the operational, analytical, and planning activities of the institution.

ACCOUNTABILITY AND HIGHER EDUCATION INDICATORS
WHAT ARE WE REALLY TRYING TO DO?

Adolph Katz
New Jersey Dept. of Higher Education

I. Introduction

During the past few years there has been considerable discussion about the need for an accountability of institutions of higher education. Concommitant with this concern is the need to identify the data necessary for accountability. In order to try to clarify what accountability may mean, let me abstract comments from two recent publications on this subject.

The first document is the "Proceedings of the Ninth Biennial Legislative Work Conference of Higher Education" sponsored by the Western Interstate Commission for Higher Education (WICHE), March 1976. The theme of this meeting was "On Target: Key Issues of Regions, State, Campuses."

Dr. Donald R. McNeil, Director, California Postsecondary Education Commission... "The first of these issues (accountability) revolves around requests for some comparative data. Everyone is now turning to "Information Systems." For higher education, this has become the era of accountability. We are asked to justify and rejustify our yearly request for new programs, facilities, research projects, staff, and money. And more and more, we are turning to "hard data" to find "hard answers" to these "hard questions"... I would simply ask that neither legislators nor educators seek salvation in statistics alone. I hold no brief for so-called "academic inefficiency," but I do plead the case for quality and philosophic commitment to our education task. Often these tasks cannot be measured by the computer; learning cannot be quantified"...

Dr. Malcolm Moos, Educational Consultant... An article in a recent MIT publication offered the observation that, if the downfall of our society occurs, it will be through death by extreme accountability... Universities and colleges, like governments, have vast layers of doers and obstructors. Their executives have little authority to invent or innovate; already they are dangerously close to being over-controlled... For each time we create a new level in a structure, a statistical blizzard of information is created that more often than not impedes rather than aids the decision-making process"...

Dr. William E. Davis, President of University of New Mexico... "On campuses, we do alot of talking to each other. Hot academic topics now relate to academic freedom, tenure, who is on faculty rank, collective bargaining, job security, salaries, due process, faculty governance, work loads, full-time equivalence, budget formulas--all familiar conversation pieces in the academic world--all important in the academic world. But how does this affect the person in the street, on the farm, or on the Legislature... One state senator, a farmer in Idaho, once vented his frustrations to me saying, 'we've had a 300% increase in state funding of public education in the past five years and substantial increases in higher education budgets. Just once I would like to know what we're doing with all this money other than raising salaries for the same teachers. I'd like to know in what ways we're raising the quality of education in our schools.' ...Within each state, within each college and university, we need to ask the Legislators in which league they want us to be. Then, as educators, we can respond, often with considerable accuracy, because the data are available for comparison. We know what it takes to compete in faculty loads, student-faculty ratios, library, salaries, research and graduate commitment, equipment and facilities. ...As presidents and leaders of educational institutions, we must be prepared with honest and realistic answers.

...We must also be accountable in seeing that the appropriate money follows the students and drives the programs, that good research is a wise investment in the future, and that our institutions are sensitive and responsive to the educational needs of the people of our respective states..."

Elizabeth H. Johnson, Director, Association of Governing Boards of Colleges and Universities, and Commissioner, Oregon Educational Coordinating Commission." ...Legislative committees get plenty of advice, and there is an almost overwhelming volume of data, information, and formula-driven estimates on their desks. If it comes, however, as it has come, from national statistics or data from the institutions or the segmental governing boards, it is too general or (understandably) biased in favor of their institutions. The accounting procedures are not uniform and unit cost cannot be compared even within the segments or within the institutions themselves. ...What is clearly indicated and is needed by both the Governor and the Legislative--and by the institutions and segments as well--is a reliable source of standardized data and information applicable to the state; of unbiased analysis, comparable unit cost estimates, definitions and accounting charts and recommendations that are based on the state-wide prospective, the public interest, and ability to finance..."

The second document, is "Information for Decisions in Postsecondary Education" the proceeding of the Fifteenth Annual Forum of the Association for Institutional Research meeting held on April 28 through May 1, 1975.

Lois E. Torrence, University of Connecticut, in her opening address as President of the Association for Institutional Research quotes from Professor Martin Trow (1975 University of California, Berkeley), "...A good deal of what has made universities really creative has been a function of bad data collection. Much of the best as well as the worst in higher education has flourished in decent obscurity. Obscurity allows for diverse practices to develop in different fields and areas... Data reveals inequalities which, once seen, must be either justified or abolished... We ought at least to entertain the possibility that it is not in the university's own best interest to gather "good"--i.e., systematic and recurrent--data on as many of its own internal operations as possible. ...Better data, generated by better data systems are demanded... by governmental authorities most often on the grounds of the public interest and better "accountability." But I believe it is not in the public interest for the private life of universities to be managed closely by remote state officials..."

Gilles G. Nadeau, of the Université DeMoncton and McGill University in his paper on "Institutional Research Data for 'What' Decisions" presents results of a survey of institutional research practices in Canada, the United States, Western Europe, and Australia. He groups institutional research activities in the United States into five categories. "...Institutional research activities are highest for self-study, goals and objectives, and long-range planning, evaluation and manpower, ...under Administration and Management, highest concerns went to physical facilities, financing, costs, and data processing.

...Under Students some 70% of respondents indicated recent studies of admission and prediction followed by studies of alumni and student records. Less than a third...indicated studies of the impact of the institution...under Faculty and Staff a greater emphasis was placed on workloads, teaching-loads, and activities studies followed by evaluation, promotion, and tenure, and research activities... under Curriculum and Instruction, highest emphasis (43%) was placed on accreditation followed by evaluation and undergraduate programs with innovations in instruction receiving attention by less than 26% of the respondents. There seemed to be no important differences between the three sizes of institutions in the United States sample."

Joseph Martin, Institutes for Services to Education, in his paper entitled "Institutional Research: Does It Make a Difference?" used the definition of Institutional Research developed by the Association of Institutional Research. "...Institutional research involves the collection of data or the making of studies useful or necessary to (a) understanding and interpreting the institution; (b) making intelligent decisions about current operations or plans for the future; (c) improving the efficiency and effectiveness of the institution."

Dwight C. Smith, Jr., State University of New York at Albany, "The Institutionalization of Information Systems," or "What We Need to Learn Beyond NCHEMS." "...The pitfalls of comparability have been described at length in prior institutional research meetings, but the messages it makes apparently have not penetrated. I will be grateful for data from another campus that makes mine look good, but on the whole, I am more interested in what has happened over a specified time span to my own campus, or college, or department than I am in how I appear in some respects (usually dollar related) when compared with another institution or program whose academic strategies may be unknown. Questions of comparability may have a superficial appeal off-campus, as the substitute for knowing what is really happening at each unit being compared, but for the campus I operate, the best possible outcome of data comparison would be for it to not appear at all--at least not until a system has first been proposed that strengthens the campus' ability to understand and manage itself in its own terms..."

Gary A. Rice, Yakima Valley College, "Preparing a Two-Year College for Accountability." "...This paper describes a locally creative, computer based MIS structure that encompasses and interlocks eight basic components of an institution's existence and operations...Several comments will be made on the task of implementation as well as tactics and strategy to involve the Board, administration, faculty, and staff. A college goals objectives accountability matrix will also be introduced and tied to the data base and simulation models. Finally, some benefits of this entire conceptual structure for the college will be cited...Because social and philosophical definitions of output are currently so elusive as to quantify, it was necessary to begin by stating them as endogenous proxy or surrogate terms like student credit hours, contact hours, and so forth which are controllable through policy decision, quantifiable, and presume to approximate the former. This task was crucial because of the inclusion of the irrelevant variables or exclusion of irrelevant variables would break the system's closure..."

Larry K. Hayes, Oklahoma State Regents for Higher Education, in his paper, "Preliminary State Level Planning for Higher Education Retrenchment" presents "...ten global criteria...identified as those factors most closely associated with institutional quality and efficiency. Institutional size (FTE), institutional momentum (change in FTE), per capita costs (E&G expenditures), student-faculty ratio, number of volumes in the library, average faculty salary, tenure status of faculty, instructional space per capita, comprehensiveness of instructional (two-year colleges, percent of career programs; four-year colleges, number of programs), instructional expenditures (proportion of E&G expenditures for instruction). These ten global criteria are part of a set of twenty factors which were thought to be related to institutional viability by the State Regents' staff of Oklahoma.

John E. Stecklein, University of Minnesota, "A Performance Index for Use in Comparative Budget Analysis"...usually...measures of input and output are combined and expressed as unit cost, i.e., efficiency is expressed indirectly (inversely) in terms of the cost of producing a certain unit, for example, $25 per student-credit-hour. Such expressions are easy to understand and useful in budget allocation and planning, but they do not provide direct information regarding the relative efficiency of the input ingredient, e.g., faculty utilization, auxiliary instructional assistance, supplies and materials used, etc. Nor do they convey clearly whether unit cost differences are due to differences in input levels, instructional processes or procedures, output levels, or all three.

In his paper Stecklein proposes a performance index which is a function of student class hours, total departmental expenditures, and full-time equivalent teaching staff. Using this performance index, he analyzes lower-division, upper-division, and graduate level college activities.

In his paper on "They Do Come Back!: Enrollment Tracking at the Community College," E. Timothy Lightfield of Mercer County Community College measures the persistence and retention of college students. "...What originated in Mercer County Community College for the purpose of concentrating upon student attrition has developed into a multi-dimensional system by which to track and understand student enrollment patterns. The monitoring of enrollment patterns at various entering classes has had real decision-making consequences at the college in terms of measuring accountability, curricula, determining cause and effect, and developing responsive programs and services to meet student needs..."

In response to the needs of accountability and development of college budgets, there is a continuing flow of information. One example of the magnitude of information available is the publication "Our Colleges and Universities Today" by the Pennsylvania Department of Education. This document contains over twelve pages of statistical tables and graphs of financial data for institutions of higher education in Pennsylvania for fiscal year 1975. These tables include current fund revenue by institutional categories, current fund revenue by purpose, source and institutional category, current fund expenditures by institutional category, current fund expenditures by function, physical plant assets, etc. It is essentially a source document. But how are the data used? And by whom?

In the development of the "annual budget" the CUNY system produces information on cost per FTE student by broad discipline group, student-faculty ratios, classroom hours per full-time faculty number, percentage of class hours taught by part-time faculty and so forth. These data are essential components of the budget process of the CUNY system. But what does it mean to the Board, the City Council, and the general public?

What are the issues and the questions related to these issues that are integral to accountability? For this, I would like to refer again to the paper presented by Elizabeth H. Johnson, Director of the Association of the Governing Boards of Colleges and Universities at the Ninth Biennial Legislative Work Conference of Higher Education. "...Basically, the new realities that now force re-examination of some of the traditional, comfortable assumptions as made about education can be summed up in six points.

1. The prospect of leveling-off and then declining enrollments, at least of the usual college-age group, resulting in steady state of enrollments and a pursuit of older learners to keep enrollments up. This will seriously affect educational planning and points up the need for more current and useful data on such things as what is happening, student migration patterns, and the relationship with financial aid to completing a program.

2. The prospects of the declining employment market for greatly increased percentages of college graduates and the growing mis-match between the level of education and available so-called "good job" openings.

3. The prospect of stringent budgets because education will have to compete, at a lower priority, with social and domestic services with the limited tax dollars that now buy less because of inflation.

4. The increasing unrest and frustration of faculty because of fewer openings in the teaching fields, and a growing movement toward unionization and the exercise of strong political power.

5. The increased volume of expressed dissatisfaction on the part of the general public with the outcome (the "product") of education at all levels and a consequent reluctance on their part to provide additional massive support. The public is reacting negatively to news such as reports of declining scores on the achievement tests, inflated grades, vandalism, duplication, abuses of federal programs, and cheating. This may be the most significant.

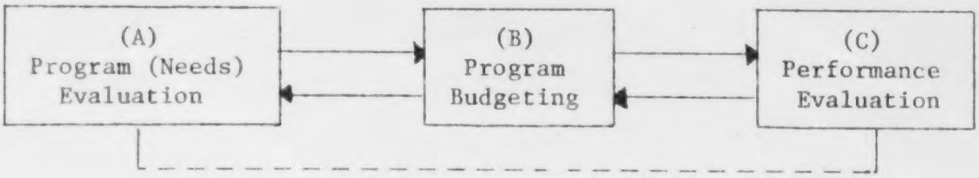
6. The prospect of having to plan for retrenchment when education thinking and funding formulas have been designed for growth. Education has become a big growth business, a desirable smokeless industry."

Our challenge is to respond to these concerns by providing both quantitative and qualitative information in a format that is comprehensive and clear to the audience that are asking for accountability.

EDUCATIONAL NEEDS ASSESSMENT: DIALOGUE BETWEEN STATE AND INSTITUTION

James J. McGovern
Connecticut Commission for Higher Education

To narrow the scope of this paper, a little time must be spent describing what will not be included. This can be rapidly done by the following framework:[1]



A. Program (Needs) Evaluation: What programs should be pursued (Extrinsic Assessment)

  - Relative effectiveness of existing programs.
  - Anticipated effectiveness of future programs.

B. Program Budgeting: What resources necessary/available per program

  - Functionally organized plan for (annual) expenditures.
  - Links multi-year plans and inter-unit program resources.

C. Performance Evaluation: What level of results was achieved (Intrinsic Assessment)

  - Comparison of stated (budgeted) and actual attainments.
  - Analysis of indicators such as outcomes per dollars, etc.

The topic-at-hand is (A) Program (Needs) Evaluation. The other two areas are minimized conceptually at this time to allow a clear perspective of one aspect of an interrelated process.

Performance Evaluation vs. Needs Evaluation

Performance evaluation is confused many times with program needs evaluation. A good reference for performance evaluation is Evaluating Institutions for Accountability[2] a "New Directions" book of the Association for Institutional Research. The editor, Howard Bowen, correctly connects performance evaluation and accountability. More importantly, he does not see accountability as an intrusion; rather he sees accountability as a duty:

> There is no valid reason why institutions should not clarify goals, gather evidence about costs and outcomes, and report the results of institutional evaluations to funding agencies and to the public. If institutions do not do these things, others will.[3]

In the same volume Alexander Astin shows the way to the methodology of performance evaluation by pointing to relative or derived measures.[4] Too often performance evaluation is not done or begun because those charged with this analysis do not realize that even the "exact" or hard sciences make progress only after they establish "arbitrary" or man-made standards and begin measurement. Those trained in science know that scales are designed on earth (e.g., ordinal: rank programs according to success, need, etc.; interval: give units or "spacing" between results, etc.) and that everything is relative. In other words, science has made progress *by proceeding*, cooperatively to be sure, but by proceeding with a thirst to know more and more about what is happening. Responsible administration requires colleges to exchange and present information if they are to bring objectivity (to some extent) and meet fiscal challenges with the help of other institutions. The alternative is subjectivism, burying one's head in the sand and causing or forcing external, generalized evaluations.

Performance evaluation has been discussed widely. A book in the "New Directions" series has been highly acclaimed: *Measuring and Increasing Academic Productivity* by Robert Wallhaus.[5] John Keller's related article "The Quest for Increased Productivity," presented at NCHEMS National Assembly[6] is a good introduction to this same area. The *Proceedings of the 1976 National Assembly* (NCHEMS) has several articles related to performance evaluation.[7] Similarly, the *Annual Forum* of the Association for Institutional Research has related articles each year. In the 12th Annual Forum, articles by Robert Wright, John Ridge and Robert Parden address evaluation philosophy, program costing procedures and institutional priority analysis respectively.[8] In the 13th Annual Forum, Oscar Lenning and William Sibley provide good articles on program evaluation and institutional accountability respectively.[9] In the 14th Annual Forum, Bernard Sheehan, Harold Hume and James Counelis have instructional articles on program budget analysis, state program budget analysis, and program productivity analysis.[10] Finally, in the 15th Annual Forum, John

Stecklein and Paul Lingenfetter discuss a budgetary performance index and a model of budgetary appropriations respectively.[11] What is absent from the professional literature is a number of articles on program needs *evaluation*, as distinct from discussions about program needs.

Program Needs Evaluation

Even within program needs evaluation, there are a number of areas which are important but which I would like to allude to only briefly.

Freshman/Basic-Skill Needs

Needs evaluation can include a determination of what basic skills in English and mathematics, for example, need improving. This can be ascertained by various evaluation tests administered both before and after admission. An excellent approach is using the Admissions Testing Program (ATP) Summary Report Service of the College Entrance Examination Board (CEEB).[12] This allows an analysis of such things as Scholastic Aptitude Test (SAT) scores, subject grade point averages, intended area (discipline) of study, etc., regarding prospective applicants, enrolled Freshman, other four-year college students within the state, etc. In this way, course needs can be determined for each college's clientele.

Construct and Behavioral Objectives

The new director of the National Institute of Education recently gave an agenda of new areas to be included under postsecondary education.[13] In particular, he stressed such things as personal development and cited a sample survey indicating that over 30% of the American adult population felt a need for some programs to assess and develop personal competencies and growth.[14] Beneath these topics are the more fundamental needs for developing constructs such as *scientific attitude* and *self-confidence* even if measures of such "behavior" may not be possible.[15] That is, although there may be difficulties with the performance evaluation of some proposed programs, that should not *ipso facto* diminish the importance of the program.

Manpower Training Needs

After writing to state higher educational coordinating agencies in the fifty states, very little was found that was helpful in the area of needs. Most of the related material dealt with manpower-needs projections.

In 1971, Arthur D. Little, Inc. did a study for the Connecticut Commission for Higher Education entitled "Needs for Higher Education Related to Regional and Statewide Economic Development in Connecticut." The projections for changes in occupational needs (between 1968 and 1975) can be easily judged in 1976. Generally, the projections were poor. For instance, aeronautical engineering was supposed to need 25% more people by 1975 while chemical engineering was cited as needing a zero increase. According to a Spring 1976 publication of the Connecticut Labor Department, just the reverse turned out to be the case.

Manpower studies and occupational needs should, of course, always be sought. However, the degree of fluctuation from year to year and the reliability of projections must be appreciated. Further, the numbers of students going into various fields affect the market or availability of positions. There seems to be evidence of the instability of a system too finely tuned between input and ouput forces. This, in turn, further "feeds" rapid shifts and fluctuations in student majors and job opportunities. (Feedback Effect)

In studying the master plans and needs evaluations from other states, one easily detects the very limited increases in job opportunities and the very large numbers of students projected for the future. Apparently state planners do not feel compelled to explain the different rates of growth beyond adding that obtaining a job is not the only goal. Further, their funding formulae do not seem to differentiate differing rates of growth among types of institutions or (heaven protect us) among various programs. The point is that we have not clearly and comprehensively coordinated the old or new objectives, dollars and student numbers.

New Wine, Old Vessels

This is the part where everyone can join the presentation. It lists some horror stories of current practices. The reigning determination of program needs, if annual budgets are examined as "indicators," is past patterns. The conventional wisdom seems to be that past patterns for funding should be tampered with only sparingly. Why assess new needs when the "fairest" procedure is to give everyone (whole systems, colleges, departments) the same percentage increase?

The Connecticut Legislature went beyond the conventional wisdom last year when they asked each unit how much money they needed to maintain present services. The result was not only a status quo in reallocations but a reenforcement of the growth areas and exigencies of the previous decade. No questions were asked about large shifts in enrollments among colleges and degree programs or about emerging needs to the individual, the economy and the common welfare. The message conveyed was that money can be allocated according to the "facts" and opinions which part-time legislators can grasp during a few meetings with advocates from diverse segments of state higher education.

Across the country there are similar cases of downgrading planning and coordinating perspectives in favor of the politics of the present. Overimpressed by a definition like "the art of the possible," some propose solutions before they have even heard about the real or main problems. It is small wonder that as statewide educational agencies move toward program budgeting (to bring about more relevant information), they also seem to need more authority (to implement savings by directing reallocations). The rationalization for constituent wants vs. comprehensive needs must be appreciated as existing at the individual, institutional and elected official levels.

State-Institutional Relationship

The question to be asked by the state is does it want to subsidize everything by the same amount. If the answer is "yes" then there are no priorities. However, if the state believes that some aspects of education are more important than others, its budget should reflect these priorities.

1. Enrollment Changes: A few needed changes seem obvious. The large increase in 18-19 year-olds that occurred beginning in 1965-66 from the post World War II baby-boom is now causing a large increase in 28-29 year-olds. The baby-boom numbers are moving through the upper 20 year-olds, beyond the traditional undergraduate ages. Yet, we have not shifted our funding

formulae, say, to the community colleges where the large influx of adults cannot find room to attend classes. On the other hand, some state colleges are "beating the bushes" to find more 18-19 year-olds. Regarding 18-19 year-olds, their numbers are leveling and their percentages continuing to college have been decreasing. Our objectives might be externally judged as accommodating the numbers of faculty rather than the numbers and needs of students.

2. Funding Changes: Percentage increases--across the board--leave little room to move with the new numbers and new needs. For instance, there are now large increases in the numbers of adults over 65 years of age. With many in this age group living on fixed incomes from Social Security benefits, should there not be special tuition rates to meet this reality? It is probably more important for the state to underwrite the continued mental health of our senior citizens than to augment the intellectual pursuits of younger age groups when the budget does not allow both.

Besides the large shifts among types of institutions, ever larger percentage shifts are occurring among the academic departments within the institutions which caused the institutional shifts in the first place. Between 1966 and 1972 biological, health, and social sciences have each increased enrollments by over 30% while engineering and physical science have decreased enrollments over 30%.[16] It would seem appropriate for each institution to account for expenditures and student numbers when applying for increased appropriations. As it stands now, usually the state does not even have a clear account of numbers of students by institution or by program. The state does not know whether the additional numbers are in expensive departments or in highly-needed departments. The justification of funding should be based on comparable facts about costs and benefits of programs so that the state can do the greatest good at the lowest cost. The request for budgeting by program and as much performance evaluation as appropriate is an invitation to monitor and react to change.

3. Economic Changes: The last two decades saw the "education industry" grow from two percent to about seven percent of the Gross National Product.[17] There are signs of decline in both higher education and the GNP's rate of

growth. The need to realize that we cannot all grow at ever-increasing rates is popularly referred to as the "limits to growth" factor after the publication by a group at MIT.[18] Nevertheless, former Secretary of Labor Willard Wirtz believes that the mind is a "boundless resource" and may be the only answer to the growth-limit dilemma. This is highly significant. Rather than just reacting to economic developments, education can act or cause economic changes and patterns by providing a growth area for jobs and national benefits. Education is a labor intensive industry creating about twice as many jobs per million dollars in expenditures as created by similar expenditures in the U.S. Department of Defense and Transportation.

We must realize that the higher educational dollars are going more and more to overhead items (fuel, maintenance, etc.) and so, unless large changes occur in minimizing new and existing facilities, we will be responsible for effectively decreasing our own budgets each year. This seems to require that the full cost of programs (direct and indirect) be calculated so that reallocations can be done at the expense of buildings etc., and not by laying off people or decreasing output services. A corollary seems to be that we should avoid measuring growth in terms of facilities, budget gains, etc., and understand that expansion and progress does not necessarily mean physical growth and more dollars. Our measures should be in terms of people.

4. *Societal Changes*: Another factor affecting educational needs assessment is the change in society or culture itself. Such sub-factors as the large numbers of women entering the labor market, the decreasing priority of 18 year-olds towards college education, the increasing trend of company education and adult (non-credit) education, non-traditional forms of studies, etc., are "indicators" of new or changing educational needs. These shifts must be studied to determine the new priorities and how higher education can meet new needs. Virtue is not in doing good according to *our* definitions but in doing what the *situation* requires. A changing *environment* requires a corresponding amount of effort to help the most affected and the most in need.

Summary

This paper attempts to get some handles on needs *assessment*. The conclusion, at this point, is that *change* must be monitored and evaluated to know "how we are doing and where we should be going." Further, the amount of change--in enrollments, state funding, the economy, society, etc.--indicates the amount of change needed in our program budgets.

Performance evaluation is thereby relegated to a necessary but not a sufficient condition in needs analysis. According to this framework, performance evaluation should be done every year generally (e.g., costs and numbers of students per program) and in detail only when there is a question. Detailed faculty analysis (types and numbers of publication, etc.) and complex cost algorithms are not wise in their own right but tertiary to larger considerations of the society and individual (Needs Hierarchy).

We never have enough money to finance everything of worth. Indeed, the future promises to make the choices and tradeoffs harder. Yet, to the extent that we are *cooperating* and diligently working towards helping our fellowman will be the extent to which human suffering is alleviated. Without such planning and hard decision-making, large numbers of faculty and students will be "set adrift" as funds are dissipated by non-essentials.

The size of environmental changes must be weighed against the outcomes and expenditures of present programs. Allowing excessive overhead costs, salaries, etc., or under-utilized facilities and faculties, is to be a co-conspirator to waste and hardships. As the French philosopher Bergson put it: *the great tragedy of civilization is that people fail to realize that the future is in their hands*. Notice the emphasis on the plural. Notice also that this is consistent with Aristotle's definition of "politics" as societal ethics (*Ethics*, Book I, Chapter II).

REFERENCES

1. Eugene Nickerson, Management Information System, Mineola: Nassau County (N.Y.), 1970.

2. Howard R. Bowen, Evaluating Institutions for Accountability, San Francisco: Jossey-Bass Inc., 1974.

3. Howard R. Bowen, "The Products of Higher Education" in Evaluating Institutions for Accountability, Howard R. Bowen (ed.), San Francisco: Jossey-Bass Inc., 1974, p. 2.

4. Alexander W. Astin, "Measuring the Outcomes of Higher Education," in Evaluating Institutions for Accountability, Howard R. Bowen (ed.), San Francisco: Jossey-Bass Inc., 1974, p. 37.

5. Robert Wallhaus, Measuring and Increasing Academic Productivity, San Francisco: Jossey-Bass Inc., 1975.

6. John E. Keller, "The Quest for Increased Productivity" in Proceedings of the National Assembly, Boulder, Colorado: National Center for Education Management Systems, 1976, pp. 85-96.

7. William Johnston (ed.), Proceedings of the 1976 National Assembly, Boulder, Colorado: National Center for Higher Education Management Systems, 1976.

8. Clifford T. Stewart, Reformation and Reallocation in Higher Education, 12th Annual Forum of the Association for Institutional Research, 1972.

9. Robert Cope (ed.), Tomorrows Imperatives Today, 13th Annual Forum of the Association for Institutional Research, 1973.

10. Robert Cope (ed.), Public Policy: Issues and Analyses, 14th Annual Forum of the Association for Institutional Research, 1974.

11. Robert Cope (ed.), Information for Decisions in Postsecondary Education, 15th Annual Forum of the Association for Institutional Research, 1975.

12. Ernest W. Beals, "The CEEB Admissions Testing Program," in Coping in the 1970's, New Haven, Connecticut: Second Annual Meeting of the Northeast Association for Institutional Research (NEAIR), 1975, pp. 235-46.

13. Harold Hodgkinson, "Planning and Management in the Face of the Changing Demographic Picture," in William Johnston's (ed.) Proceedings of the 1976 National Assembly, Boulder, Colorado: National Center for Higher Education Management Systems, 1976.

14. Ibid., p. 38.

15. L. J. Cronback, "Validation of Educational Measures," in Proceedings of the 1969 Educational Testing Services Invitational Conference on Testing Problems: Princeton: Educational Testing Services, 1969 in Sidney S. Micek's "Outcome-Oriented Planning in Higher Education," Boulder, Colorado, National Center for Higher Education Management Systems, 1973, p. 12.

16. U.S. Department of Commerce, Bureau of the Census, "Social and Economic Characteristics of Students," October, 1972, Series P-20, No. 260, February, 1974, p. 8.

17. Kenneth Boulding, "The Management of Decline," Change, June, 1975, p. 8.

18. Donella Meadows, et. al., The Limits to Growth, New York: The New American Library, 1972.

THE UNDERGRADUATE EXPERIENCE AND INSTITUTIONAL GOALS: A CASE FOR THE COLLECTION OF "SOFT" DATA

Larene Hoelcle
SUNY at Buffalo

"The Ideologies of 'Tough Times'," which appears in the August, 1976, issue of Change, is an insightful, reasonable, vital, and persuasively written article, interesting for the analysis it provides and the values it defends. Of interest also to those of us who are concerned with higher education's individual development goals is its twenty-five year old author, Martin Kaplan. A graduate, with honors, of some of our most prestigious educational institutions, he seems to embody the student-development goals to which many of us would enthusiastically subscribe. He is liberally educated, with a taste for study and reflection, and has an ability, even a compulsion, to arrive at value positions, to make choices. Highly trained and apparently self-motivated, he is prepared to be a productive member of society; he is even employed. An individual with a well-developed intellectual style, he is serious, responsible, and critically concerned with society and his role in it. His own statement of goals for higher education derives from his view of what adulthood implies:

> ...Roughly between the ages of 15 and 25, people come of intellectual and moral age. Through their education, their peers, and their world, they learn that some of the ideas and values that they have acquired make sense, and that some do not. They learn to recognize the premises and assumptions that underpin arguments, and they learn to deal critically with those underpinnings. They gain facility at scrutinizing social institutions, laying bare the values and special interests embedded in them. They understand what being a "political animal" means and what "consent of the governed" implies. They come to tell the difference between ideas and values and structures that are natural, and those that are conventional. However tentatively, they begin to sort the events of the world into "have to be that way" and "happened to be that way." And when they spot a conventional act, a "happened to be that way," they can also try to see whose particular interests and values are being served by those conventions. To spot a convention is to begin to participate: What is socially made can be socially unmade, remade, changed.

He concludes:

> My placing critical responsibility at age 25 or so - at the exit from formal schooling, at the moment of entry to the worlds of getting and spending and procreating - is also, of course, a distinctly normative gesture. It is not a claim that all young adults can spot a hidden premise, or that they all have the energy and talent to resist and revise their society. Rather, I'm suggesting this as a dream, a vision, a moral goal for education.[1]

Here is a restatement of some of the traditional purposes of higher education: the development of critical intelligence, of moral judgment, and of social responsibility. Other writers have advocated that colleges be concerned with the psychological, social, and emotional development of students, helping them to develop self-knowledge, understanding, confidence, aesthetic taste and expressions, and realistic self-assessment. Some aspects of individual student development have been cited as primary goals by every major commission concerned with higher education from the Truman report in 1947 until the present. Some combination of these outcomes are promised by myriad college and university catalogs. Of course, these values are deeply rooted in the liberal arts tradition, elitist as that tradition often was. But these self-development goals are not the luxury of a wealthy nation or of an inheritor class alone. They are the most democratic of goals. In the context of universal access and lifelong learning, they are advocated by the UNESCO Commission report, Learning to Be: "The physical, intellectual, emotional and ethical integration of the individual into a complete man (sic) is a broad definition of the fundamental aim for education."[2] While the Carnegie Commission was not willing to go so far, its list of purposes of higher education begins with individual development:

> The provision of opportunities for the intellectual, aesthetic, ethical, and skill development of individual students, and the provision of campus environments which can constructively assist students in their more general developmental growth.[3]

The Carnegie Commission recognized that students themselves, undergraduates at least, viewed

> the college experience as one related to their total developmental growth, and not to the cognitive and occupational aspects of their lives alone. They thus expect more out of their college experience than the college, as an institution, often can and even should deliver, particularly in the area of personal development.[4]

Colleges should, in the Carnegie Commission view, provide a supportive environment within which students can tend to their own emotional and interpersonal growth. Not a bad summary of what, under the best conditions, probably happens. But this view is a peculiar one, separating emotional and interpersonal growth from the study of the arts and humanities in which context such growth was once presumed to take place. Emotional growth, facilitated by interaction with faculty as well as peers, and sparked by insights gleaned from classical and modern writers, was more than an accidental byproduct of traditional liberal education. Why can't modern insitutions deal with these aspects of individual development?

In any event, to the extent that colleges and universities espouse personal development goals for their students, how do they measure their success at achieving these outcomes in the lives of their graduates? Put another way, would any institution or combination of schools have served Martin Kaplan as well, or did Harvard or Cambridge or Stanford do something right? What did they do? What are the ties between higher educational experiences and student outcomes?

In the same issue of Change with the Kaplan piece, is a brief discussion by Harold Howe of "The Trouble with Research in Education."[5] He observes that there is a vast amount of very bad educational research; that even the good research is presented in such a way that educators and policy makers cannot read it let alone use it; and that the nature of the educational enterprise, dealing as it does with individual human beings with diverse needs and experiences, precludes the possibility that research will provide simple, definitive, broadly generalizable conclusions. From the perspective of higher education there is another point to be made as well: even the good research generally fails to build bridges between what the institution does and what the student learns; or between how the student changes and what initiates or encourages or sparks that change. This is a difficult order--an impossible task for classical experimental research. You simply cannot control that many variables! You can, however, gain some insights into student experiences with which to make colleges and universities pay attention to the implementation of their expressed student development goals. You can begin to find ties between what the college does and how students change by exploring the student experience.

The word "explore" is used advisedly--the research we need is cumbersome; the data are hard to handle, and the process is amazingly time consuming. We have to do exploratory research because we have very little theory to test and a great deal to develop. Many of the questions to which we need answers are maddeningly general. For example, such questions as these should be directed to students and former students:

What have been the primary values of your college experience?
What experiences have contributed most to your development personally, socially, aesthetically, vocationally?
What would have increased the value of college for you?
What would you have done differently?
What could your college or university have done differently?
What are the priorities of your institution? What should they be?

These and similar questions are open-ended because we do not know what students think, what they seek, or how to facilitate their efforts. At least, we can no longer assume we know these things. They change with each new clientele we presume to serve: older students, members of diverse ethnic groups, children of blue-collar workers who are first-generation college attenders, and the culturally and educationally disadvantaged.

Longitudinal studies are desirable, because we want to know how students change over time, where changes take place, why they take place, and how the institution has helped or hindered them. Case studies are valuable, because changes are unique, personal, individual. In short, methods and research designs should be employed that take a critical look at college life through the eyes of those who are experiencing or have experienced it.

To what uses will the products of this type of research be put by our colleges and universities? What can we do when we know what we are doing right for significant numbers of students? What we cannot expect to do is everything. Kerr's notion of a "multiversity" to meet everyone's needs is an impossible dream, albeit a brave one in the 1960's. Drawing upon all of the most frequently cited philosophies of higher education, Kerr suggested that

> A University can aim no higher than to be as British as possible for the sake of the undergraduates, as German as possible for the sake of the graduates and the research personnel, as American as possible for the sake of the public at large--and as confused as possible for the sake of the preservation of the whole uneasy balance.[6]

But we do not need to be, nor can we be, all things to all people; that is not what individual development implies. By exploring what we do best and specifying our goals, we can appeal directly to students, selling our institutions realistically to prospective consumers. Some, the small, private, sometimes sectarian institutions, have always known what they had to offer. The rest of us need to find out, and to tailor our admissions policies and our advertising to certain types of students with particular purposes and interests.

This point is clearly related to the current demands for "consumer" protection, for prospective students and their families to have realistic information about what the schools they consider attending have to offer and what they can expect to accomplish by enrolling in them. Our students are gentle critics, kinder to us than we probably deserve. Their observations about the school atmosphere, its priorities, and its contributions to their development describe the value of our offerings at least as reliably as other assessments and probably more persuasively.

The use of student data to clarify and specify our goals will aid in program development as well. It can serve as a basis for curriculum revision, as well as a rational framework for providing the types of co-curricular or extracurricular experiences of value to students. Such data can also be used to develop evaluation tools to measure our success at reaching the goals we set for ourselves.

It will come as no great surprise to you to hear me confess that the type of research I advocate is indeed the type of research in which I am involved. The Office of Student Testing and Research at SUNY/B initiated a longitudinal study in 1966, using two random samples of 100 students each from the 1966 and 1967 entering freshman classes, respectively. Each group was interviewed twice during the freshman year and once in each succeeding college year. Follow-up questionnaires were administered each year thereafter for a total of ten years for each sample. Descriptive studies, based on each year's returns, have been and are being prepared and distributed for the information of the university community as well as prospective students and the community at large. Although the real work of longitudinal analysis has hardly begun, there have been some payoffs along the way. Students evaluated their academic experiences, reporting what they liked and disliked about their teachers and their courses.

We forwarded these comments, anonymously of course, to the department chairmen to aid in the evaluation of their offerings. Having data on the student experience has shored up the position of the Division of Student Affairs in its dealings with other university divisions and with the central administration in negotiations for increasingly scarce funds and personnel, and has enhanced our role as student advocate in all our dealings with other university departments and divisions. Finally, in the discussion of university goals that informs the writing of ten-year plans and evaluation documents, the case for greater attention to individual student development can be made based on student-expressed values and perceptions of the role of the university in fostering their development.

But where are the connections we seek between the higher educational experience and student growth and development? In the SUNY/B study, they are still to be found in the analysis of the longitudinal data and the development of case studies on several members of the two samples who responded every year, and perhaps some who dropped out for a time and told us why. We believe that the keys are there and that we will find at least some of them. In the meantime, the project has been valuable for selling the university to prospective students; for informing students, faculty, administration and staff, as well as the public, about what college life at SUNY/B is like; for providing fuel for student advocacy in a world where lots of legitimate interests compete for increasingly rare resources; and probably for improving the college experience for those students who have taken part in the study over the years and have thus been encouraged to evaluate their experiences in light of their developing goals.

What goals do we set for higher education? How do we pursue them? Martin Kaplan presents one set of goals, and suggests one way to approach their realization in young adults' lives.

> Perhaps we need more techniques for worrying our students. We could use more ways to interrupt the unimpeded flow of fact from us to them, more ways to intervene and meddle in their moral lives, more ways to focus their attention on some questions that education seems recently to have forgotten--questions like, who am I? and where do I want to go? and, what do I believe?[7]

Perhaps that's what Harvard did right for Martin Kaplan, or perhaps he wishes it had. Perhaps a large proportion of our students would be delighted with those prospects. Certainly a large number of our interview group members welcomed our "meddling" in their lives over the years. As one person reported in his senior interview,

> I think the project has been a good thing for me, that I was one of the one hundred people picked out. I think too, that it's been good for all the other kids. It's helped them by having somebody questioning and listening. It's helped them to know more about themselves. So, besides helping you, you've helped me. I've had a chance to express myself and my views. Then when you hear yourself say these things I think you understand yourself a little better. . .

Nine years after his participation in the study began, another person wrote:

> I should like to be able to compare this questionnaire with my very first interview. I think it would be interesting to see if the change I feel within myself has indeed taken place.
>
> I always look forward to this questionnaire with a sense of dread--but I think it forces me to reconsider my feelings and values. We need to do that occasionally.

In any event, I want to know what the State University of New York at Buffalo is doing well so we can do more of it, and what we could do well and should be doing to enhance student growth. And I believe that students can tell us in ways that can be used to refresh our perspectives and give new direction to some of our endeavors.

FOOTNOTES

1. Kaplan, Martin. "The Ideologies of 'Tough Times'," *Change*, August, 1976, pp.22-31.

2. International Commission on the Development of Education. *Learning to Be. The World of Education Today and Tomorrow*. Edgar Faure, and others. Paris: UNESCO, 1972.

3. The Carnegie Commission on Higher Education. *The Purposes and the Performance of Higher Education in the United States: Approaching the Year 2000*. New York: McGraw-Hill Book Company, 1973, p. 1.

4. *Ibid*., p. 15.

5. Howe, Harold II. "The Trouble with Research in Education," *Change*, August, 1976, pp. 46-47.

6. Kerr, Clark. The Uses of the University. Cambridge, Massachusetts: Harvard University Press, 1963, p. 18.

7. Kaplan. *op*. *cit*., p. 31.

HARCUM FRESHMEN SELF-EVALUATE THEIR PREPARATION FOR COLLEGE

Boris Blai, Jr.
Harcum Junior College

The quality and depth of high school preparation for college has significant impact upon the many dimensions of student coping behavior. Therefore, in an effort to obtain information about those areas in which Harcum freshmen believed that they needed help before entering college, an anonymous questionnaire survey was conducted. The practical implications of this type of information for both secondary school and college guidance counselors, as well as instructional staff, are clearly obvious--for this approach can yield specific information regarding the areas in which students believe they need help, or counseling. In short--pinpointing those areas which, in the students' collective perceptions, represent the skills and knowledge most frequently considered to be deficient, is the first practical step in identifying those specific areas which should receive greater attention in the future.

There is, today, little disagreement with the view that the reasons for failure of students to satisfactorily achieve their collegiate aspirations are many and varied. Some of these obviously devolve upon the student, yet others are more appropriately ascribed to the college learning experience, or environment. Both, however, share a common characteristic--they are subject, in varying degrees, to change and modification.

Those who are assigned the responsibility for educational and student life decision-making, are the accountable individuals who must determine what shall be done to 'close' such preparation gaps. In addition--they must also make another important, pragmatic decision: what shall be the order of priority followed in seeking to modify a variety of existing conditions and practices? Some of the major areas to consider are the following ones:

1. lack of adequate subject-matter preparation of students;
2. lack of student motivation to study and learn;
3. student personal adjustment and emotional problems resolution;
4. student lack of realism about college 'life'--both academic and non-academic dimensions; and
5. student financial problems.

In considering these areas, certainly the views of students themselves are most germane in seeking to identify conditions of maximum effectiveness within secondary schools, in their task of helping prepare students for sound college articulation.

As one means of approaching this assessment assignment, The Student Educational Questionnaire instrument was utilized. It was designed by Thomas R. Coleman in 1974, and was utilized in connection with a practicum submitted to Nova University in partial fulfillment of requirements for a doctoral degree.

The questionnaire was administered to Harcum freshmen in February 1976 as a structured and standardized method for exploring the students' self-evaluated assessment of quality of their high school preparation for college attendance. Some 272 freshmen, after completing one full semester, responded to the questionnaire--anonymously.

The questionnaire instrument (which is attached as an Appendix to the paper which relates to this presentation), was designed to explore three broad categories of information. These are: items 1 through 9 relating to Educational Information; items 10 through 15 which relate to Psycho-social Information; and items 16 through 19 which concern themselves with Vocational Information. By this structuring of items, the responses of the students immediately identified the specific dimensions in which they believed they needed assistance--or counseling. An open-ended questionnaire was also included, permitting students to respond freely and write in other areas in which they believed they were ill-prepared to cope upon entering college.

The group-assessed strength of need for each of the questionnaire items was determined as follows: a numerical score of 1 was assigned for each item selected as a "Least" need. A 2 was assigned for each one selected as a "Some" need, and a 3 was assigned for each one selected as a "Most" need. Therefore, the degree, or 'strength' of group-assessed needs, could be conveniently expressed as a percentage of the maximum possible 'score' for any item--this maximum being a score of 816, derived by multiplying the number of respondents--some 272--by the "Most" score of 3.

The group-determined priority-ranking--or relative 'strengths' of expressed needs--consisted of the following, listed in descending order of need strength:

1. Reading skills 69%
2. Studying for an exam 67%
3. Improving my motivation 64%
4. Preparing a bibliography 62%
5. Math skills and concepts 61%
6. Selection of goals for when I leave Harcum 60%
7. Obtaining financial aid 59%
8. Selection of schools, vocations, and opportunities after I left high school 58%
9. Organizing and budgeting time in order to meet school deadlines 56%
10. Awareness of extracurricular activities 55%
11. Selection of courses appropriate for me 54%
12. Notetaking 53%
13. Gaining the proper information regarding admissions exams and applications 52%
14. Identifying my interest areas 50%
15. Helping me cope with failure 49%
16. Helping me get along with teachers and meeting their expectations and demands 46%
17. Preparing term or research papers 45%
18. Helping me with my social interactions with peers 44%
19. Helping me with my personal problems and social adjustments 40%

Among the 5 strongest needs expressed, 4 are in the Educational Information category. They are: Reading skills--the greatest need, or preparation-gap; Studying for an exam; Preparing a bibliography; and Math skills and concepts.

The only non-Educational Information category included among the top-five needs was "Improving my motivation"--a Psycho-social item. In a sense, this one, as well, is closely related, for although not stated, a reasonable inference is that the motivation relates to studying, learning, and matters 'academic'.

If the percentage 'strengths' of these 19 student-assessed needs are averaged for each of the three major categories, the following results: for Educational Information--58%; for Vocational Information--56%; and for Psycho-social Information--50%.

Several general conclusions are suggested by the results of this questionnaire inquiry:

1. Preparation in various academic 'skills' areas is very clearly foremost in the 'preparation-gap' needs perceived by these Harcum freshmen.

2. Following closely are the Vocational Information needs, and the least-expressed 'concerns' were for the items in the Psycho-social Information area.

3. Among this group of freshmen students, the intensity level of these felt needs is quite 'high', when expressed as a proportion of the maximum possible need-score. The very least degree of concern expressed was 40%--the item being: "Helping me with my personal problems and social adjustments".

4. These Harcum freshmen have expressed strong levels of concern regarding various dimensions of their high school preparation for college attendance. Do these 'preparation-gaps' result from student 'failures' to learn? From teacher 'failures' to teach? From guidance counselor 'failures' to counsel? Or perhaps a combination of all factors? Whatever the proximal causes, this questionnaire survey revealed some serious 'preparation-gaps', as perceived by a recent class of Harcum freshmen.

The extent to which these results may be generalized beyond Harcum is a matter best answered by replication of the questionnaire query among another sample of freshmen students. In any event, it is a scheme offering ready identification of freshmen perceptions which can be of considerable value--both to instructional and guidance personnel.

HARCUM JUNIOR COLLEGE

Office of Research

Student Educational Questionnaire

This brief questionnaire invites your considered views. It is not a test. There are no 'right' or 'wrong' answers! It is a completely confidential survey of the opinions of Harcum freshman as a group: do not sign your name.

Thank you for your serious and helpful cooperation.

February 1976

Boris Blai, Jr., Ed. D.
Director of Research

* * * *

Your Harcum program of study (Secretarial, Animal Technician, Liberal Arts, etc.) ______________________

Directions: - Please circle the number which you believe best defines your needs BEFORE entering college.

1- refers to NEEDING THE LEAST help in that area
2- refers to NEEDING SOME help in that area
3- refers to NEEDING THE MOST help in that area

Just before entering college, I believe I needed help in the following areas:

	Least	Some	Most
1. notetaking	1	2	3
2. preparing term or research paper	1	2	3
3. preparing a bibliography	1	2	3
4. studying for an exam	1	2	3
5. reading skills	1	2	3
6. math skills & concepts	1	2	3
7. organizing & budgeting time in order to meet school deadlines	1	2	3
8. obtaining financial aid	1	2	3
9. gaining the proper information regarding admissions exams and applications	1	2	3
10. improving my motivation	1	2	3

	Least	Some	Most
11. helping me with my personal problems and social adjustments	1	2	3
12. helping me with my social interactions with peers	1	2	3
13. helping me to get along with teachers and meeting their expectations & demands	1	2	3
14. helping me cope with failure	1	2	3
15. awareness of extracurricular activities	1	2	3
16. selection of courses appropriate for me	1	2	3
17. identifying my interest areas	1	2	3
18. selection of goals for when I leave Harcum	1	2	3
19. selection of schools, vocations and other opportunities after I left high school	1	2	3

20. Are there any other areas in which you believe you were ill-prepared to cope when you entered college? Please name and comment upon them here.

Your cooperation is sincerely appreciated.

SUMMER ORIENTATION PROGRAM 1974: AN EVALUATION

H. William Coles, III
SUNY at Buffalo

Programs and projects, as we are all aware, are often initiated, modified, and terminated in response to individual and collective whims and passions. Those with the most political clout reshape programs to reflect their own dispositions and perceptions, disregarding frequently the objectives and the effectiveness of the programs. A more logical course of action (and these terms occasionally trigger an automatic disregard for the ensuing discussion), particularly in decisions regarding large expenditures of resources, is to evaluate programs on the basis of their effectiveness in carrying out their objectives. The following report describes one such program evaluation, initiated out of the controversy created by lack of information and consensus as to the purpose and mechanics of the program. The evaluation is described from inception, through implementation, to its conclusion, and should serve, at least, as an impetus for evaluation in general and, hopefully, as a model for the evaluation of similar projects.

The Summer Orientation Program (SOP) at the State University of New York at Buffalo (SUNY/B) is an extensive program which involves approximately 2,200 freshmen each year and virtually every university office which works with undergraduates. The 1974 SOP consisted of twelve conferences conducted for freshmen expecting to enter SUNY/B in the Fall of 1974. All incoming freshmen were invited to attend one of the conferences in order to plan their first semester academic program and register for their Fall courses as well as to meet other students and familiarize themselves with the resources of the University.

From July 15 to August 23, two conferences were conducted each week; one from noon Monday to 11 A.M. Wednesday, and the other from noon Wednesday to 11 A.M. Friday. All students who attended the conferences, whether they intended to be residents or commuters, resided in the dormitories during their stay. A wide variety of activities and programs were offered. Daily activities and workshops focused primarily on academic advisement and course registration; several programs and tours were available to familiarize the students with the facilities and services of the university. Numerous activities and workshops offered during the evenings provided the students with opportunities to socialize with fellow students and to become further acquainted with the university.

The goals and policies of the Orientation Program are formulated and implemented by a coordinating committee, consisting of representatives from the six areas involved with the freshman orientation: Division of Undergraduate Education (academic advisement); Admissions and Records (registration materials and procedures); Student Activities (training of the student aides and programming for the conferences); Office of Educational Opportunity (minority student programs); Housing Office (training of resident advisors and supervision of dormitory activity); and Student Association (introduction to student government and activities). The committee initiated an evaluation early in 1974 out of concern on the part of some of its members that the conferences were too extensive or, perhaps, not even needed. Representatives from Admissions and Records, for instance, felt that just mailing out the registration materials would be sufficient, while representatives for the academic advisors strongly desired either a mailing of registration materials or a much shortened orientation program consisting of academic advisement and registration to be held during the academic year, either in the Spring or the Fall. Several offices in the Division of Student Affairs strongly argued to continue the program in its present state, concentrating on interpersonal communication and increased familiarity with the university in addition to advisement and registration.

Discussion was, in fact, so heated that a workshop was formed to discuss the goals for the orientation that would provide a framework within which to formulate short and long term operational objectives. The offices and divisions involved invited an outsider to participate in the workshop who was experienced in workshop leadership and who could assist the committee in defining its goals and objectives.

After much discussion and deliberation, the goals were agreed upon and listed as follows:

To initiate development of a sense of competence regarding the utilization of university physical and human resources;

To cultivate an environment conducive to the freeing and expansion of interpersonal relationships among peers, faculty, and staff, and to encourage mutual trust and respect;

To initiate the development of a sense of individual purpose within the higher educational experience;

To create an environment which fosters potential for enlightened criticism, innovation and self-study;

To initiate development of a sense of institutional identity and, consequently, a perspective from which to deal with common problems (i.e. alienation);

To help students develop a respect for their own abilities and those of others and a realistic understanding of their respective limitations;

To initiate development of an individually meaningful balance between autonomy and interdependence.

The committee proposed that the next orientation program, Summer, 1974, be evaluated by outside evaluators to determine to what extent the present program was fulfilling these goals and in which ways it could be modified for improvement. Data from students who had attended the conferences seemed a more rational basis for decision making than the armchair philosophizing that had characterized previous discussions.

The committee postponed an outline of the aspects of the program that they wanted evaluated. Detailed proposals regarding questionnaire design, administration, sampling, and data processing and analysis were requested. Proposals were submitted and later defended before members of the committee.

The evaluation itself was two-fold: (1) examination of the overall effects of the programs on the students and the changes desired by the students, and (2) determination of the effectiveness of the various specific aspects of the program in meeting the stated goals. The first step was the clarification of the objectives of the SOP. The committee had discussed and defined their goals for the program. These goals now had to be operationally defined. The six offices directly involved with the program were contacted to determine the manner and form of their participation in the program, and to clarify and operationally define their particular objectives.

Extensive efforts were made to explicitly define the role of each of the offices in the program, pushing the representatives, almost literally, to delineate what they wanted to do and how they were going about that task. Explanations were solicited regarding the details of their interaction with the students, particularly the type of programs provided (purpose, nature) and the aides and materials involved.

In this manner, questionnaire items were designed to evaluate the overall effect of the conferences on the students and the effectiveness of the efforts of the individual offices. The items were formulated and then discussed with individuals from the respective offices and with the coordinating committee. The objective of each item was to provide information to the offices and to the committee on the effect of their efforts, providing them with information as to what extent and in which areas their workshops and programs were working and their personnel and materials effective.

Items intended to evaluate the overall effects of the program and the changes desired by the students were constructed to enable students to specify the types of concerns (anxieties) they had before attending SOP and to indicate the effect attendance had on their degree of concern. Items were also designed to allow students to note changes they would have liked in the types of activities available during their SOP and to indicate the desirability of including various activities in future programs. Modifications in the location and duration of the programs were also recommended.

Each conference of the Orientation Program consisted of about 30 activities, primarily programs and workshops for course registration and academic advisement, and activities and experiences for socialization and familiarization with the university. To assess the benefit derived from each of the activities and programs available during the SOP, three dimensions were investigated: student attendance at each function; the contribution to meeting fellow students; and the contribution to familiarizing students with the facilities and services of the university. Although all activities were examined relative to these three aspects, some activities, of course, were included in the SOP for other reasons. Therefore, findings of low benefit in socialization with students and/or familiarization with the university do not necessarily indicate lack of value in these other dimensions.

The experiences of freshmen at the Orientation Program can strongly affect their expectations of interactions with university personnel during their college years. Their perceptions of the helpfulness, friendliness, and interest of university staff were investigated by asking the freshmen to rate several groups of SOP personnel on these dimensions. The groups were: student aides, registration aides, librarians, academic advisors, and resident advisors.

Students were asked to indicate how helpful and friendly/interested in them each group had been during SOP. The latter two dimensions were combined because of their close relationship and the greater appropriateness of one or the other in various situations discussed. Respondents also reported the helpfulness and friendliness/interest in them of the academic advisors and librarians during the Fall semester. The amount of student contact with the academic advisors during the SOP and the Fall semester was also reported.

Since one of the main functions of the Orientation Program was to assist the freshmen in selecting and registering for courses for the Fall semester, the freshmen were asked to indicate the helpfulness of the course information available and to note difficulties in completing the registration forms. The freshmen also reported the number of primary courses for which they were successfully registered when they returned to the university in the Fall.

The questionnaires were sent to a sample of 599 students randomly selected from the 2,129 students who attended the SOP. They were mailed in the third week of October, 1974; three follow-up cards were mailed urging completion of the survey. The evaluation was timed for the end of October in order to gain the students' perspective of the SOP after having completed half of the Fall semester. By this time, it was felt that the freshmen would be familiar enough with the procedures, regulations, and life at the university to effectively evaluate the preparation they had received during SOP. Two hundred and twenty-four students, 11 percent of those who attended the 1974 SOP, returned usable questionnaires.

Analysis of their responses indicated that the 1974 SOP provided a socially positive and academically realistic perspective of their pending university experience.[1]

The findings indicated that the Orientation Program provided the students with a wide variety of opportunities to meet fellow students and to become familiar with the facilities and services of the university. Program attendance seemed to lessen the students' anxiety in social and personal areas. Concern with the impersonalness of a large university, social competency, and personal adjustment decreased, although the students reported that they would have liked more information about the university's facilities and services. The relative success of the students socially was reflected in their greater satisfaction with the existing levels of social activities.

The student aides, the registration aides, and the academic advisors were reported to have been helpful and friendly/interested in the students regarding registration. Their efforts seemed successful; most students were registered for at least three of four primary courses when they returned in the Fall.

The academic advisors were also helpful and friendly/interested in the students in academic areas. They were reported to be more helpful and friendly/interested in the students during the Summer program than during the Fall semester. Fewer students discussed personal problems with their advisors than discussed academic problems, and most of those who did discuss personal matters reported that their advisors were not very helpful or even friendly/interested in them. It should be remembered, however, that the function of the academic advisors is academic advisement, not personal counseling.

In spite of the efforts of the academic advisors, students reported that SOP attendance heightened their anxiety relative to academic areas: courses (selection, getting desired courses, class size) and their own academic competence. Difficulties in selecting and registering for courses and contact with numerous students with equally impressive academic credentials may account for much of the increased concern. This heightened concern with academics is reflected in the types of activities the students reported that they would have liked in their orientation program: more academic-related programs, particularly more interaction with faculty members; and more academic information (requirements, grading, courses, etc.).

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[1] Coles, H. William, III. Summer Orientation 1974: An Evaluation. Student Testing and Research, SUNY at Buffalo, 1975.

Students emphatically endorsed the need for an orientation program for incoming freshmen and indicated that it should be three or four days long and held on both campuses of the university. Recommended emphases of the activities were again familiarization with the university's facilities and services, social activities with fellow students, and academic counseling. Small-group discussions of concerns and interests were also advocated. Increased faculty involvement in the program was indicated to be desirable relative to academic counseling and discussion of students' concerns and interests; social contact with faculty and sample lectures, however, were of interest to considerably fewer students.

The evaluation of the SOP provided the committee and each of the supporting offices with detailed information upon which to base their decisions. As a result of the findings the coordinating committee recommended that the Orientation Program remain a series of conferences held over the Summer. Faculty involvement was to increase in the academic counseling area with the designation of specific conferences to emphasize special areas such as natural sciences, engineering, and health sciences, in which the faculty from these respective areas would play a much more active role. Several of the programs and workshops were omitted and others redesigned as a result of the student responses.

ROOM USE DATA - USE AND MISUSE

Loren Gould
Worcester State College

One of the problems facing the Office of Institutional Research at Worcester State College is how to present room use data that is accurate and yet that is acceptable to those wishing to argue for or against the need for more classroom space. This is an area that might seem to be a simple gathering of purely objective data but upon inspection the methodology to glean the data is extremely subjective. Presidents wish to have data that will aid their arguments that more classroom space is necessary while legislators are looking for data that proves the college is underutilizing its space. The Office of Institutional Research is caught between the two positions trying to develop as objective a measure of room use as is possible but one that, at the same time, will be acceptable to both groups receiving the data.

Here at Worcester State we first began collecting room use data nearly ten years ago by totaling the percentage hourly use each room had, based upon the then existing thirty-six hour week (eight hours on Monday-Wednesday-Friday and six hours on Tuesday-Thursday). See attachments A and B. At the same time the percentage use was broken out into general use classrooms and special use rooms. General use classrooms were defined as ones that any department might be assigned to for lecture-discussion types of courses while special use rooms were primarily laboratories of one kind or another. This type of analysis resulted in rather high use percentages and was obviously not objective since no consideration was made of the other 132 hours in each week. Just by beginning the school day at eight in the morning instead of eight-thirty and ending it at five in the afternoon instead of four-thirty would have added three hours a week and by making Tuesday-Thursday the same as Monday-Wednesday-Friday would have added an additional six hours for a total of forty-five available hours each week instead of the thirty-six used. The evening hours from four-thirty to ten p.m. were used by the Program of Continuing Education when the room use survey was begun but since the program used a limited number of rooms without a great number of students the program was not calculated into the room use study. This is no longer true today when the Program of Continuing Education serves two-thirds the number of students in the day enrollment. However, in this paper the Program of Continuing Education will not be included although some references to it will be found on some of the attachments.

Attachment A shows the percentage of classroom and special room use for four consecutive semesters and with a detailed breakout of the most recent semester at the time of the report. The detailed data contains information relative to the Program of Continuing Education but this data was not included in developing the percentages shown. This is a typical example of the room use study produced during the first several years. Attachment B shows similar information from a couple of years later. At this time, however, only the general use classroom percentage was developed since it was felt that the special use room percentage did not and would not change appreciably.

Another factor not included in these studies was the size of the classes and any inefficient use of rooms resulting from small classes. Consistently over the years, five to six per cent of the classes at the college have been five or fewer in enrollment and a glance at attachment C reveals that the smallest general use classroom has twenty-five student stations. Attachment C lists the capacity of all rooms as of the date of the report. Recently, a number of small classes have been held in professors' offices without being listed as assigned classes but appearing on the roster under the guise of TBA (to be announced) in regard to location.

In 1970 the Office of Institutional Research began to use an alternative method of presenting room use data. This consisted in using the percentage of the undergraduate student body assigned to classrooms each hour of the class day as a measure of room use. This did not require the separation of general and special use classrooms and the sizes of the classes had no bearing upon the percentages developed but the resulting figures were fifteen to twenty per cent lower than those developed by the prior method thus reducing the college's justification argument for more classroom space.

A typical example of this type of report is shown on attachments D through H. Attachment D explains the methodology and summarizes the results of the study along with supplying a key to the visual presentation of the data as shown on attachment E. Attachment E shows the data in a visual form with horizontal stripes indicating the hours with above average assignment of students to classrooms and the other patterns indicating below average assignment of students to classrooms. The darker the symbol, the further removed from the average the particular hour is. Thus the eighth hour on Wednesday and Friday is the low point in student assignment to classrooms while the greatest assignment of students occurs during the second, third, and fourth hours of the day. Another factor as to why the lack of student assignment to classrooms in the late afternoons is a result of the changing times that have occurred in colleges nationwide. Unlike years ago, both faculty and students have choice as to when courses are offered. The faculty, through their department chairpersons, choose the times that they wish to offer the various departmental courses. Then the students, through a lottery method, select the courses and times that they want. As a result of these options the late afternoons tend to be vacant. If I were to return to teaching I know what hours I would choose in order to have small classes. Usually seniority tends to rule in departmental time selections and most faculty would like their afternoons free. This results in the newer faculty, basically unknown to the students, dominating the late hours of the day when our students want time to work at the part-time jobs most of them hold. This is an inefficient use of room space that is very difficult to explain to state legislators who are out of touch with the changes that have taken place in colleges in the past ten years and is one of the reasons why any paper that I present is always sent to the chairman of our state Ways and Means Committee. Attachment F shows the percentage of the total student body that are assigned to classrooms each hour of the school day. Rather than showing the deviation from the mean as attachment E did this attachment shows, for example, that only nine per cent of the entire student body is assigned to a classroom on the eighth hour on Friday afternoon compared with nearly half the student body population assigned to classrooms on the second hour of Monday-Wednesday-Friday. Attachment G supplies the numerical variation in the number of students assigned to classrooms each hour from the mean. This shows, with numbers, what attachment E shows visually. Attachment H shows the number of students assigned each hour to classrooms with cumulative totals to show which days and which hours have the greatest number of assigned students. It is self-evident that all five of these attachments are showing the same information but in different ways and with different amounts of detail with the first page (attachment D) giving the most general verbal description and with attachments F, G and H giving the more specific details. During the five years that this format was produced by the Office of Institutional Research, requests came from the President's Office for the previous method of calculating room use because the earlier method showed considerably higher percentage of use figures. Thus during most of the five years both reports were produced.

Attachment I is a sample of a report issued when needed to update the status of the number of student stations available in each room. This was done by actually going to each room and counting the student stations available. In the case of the laboratories there was little or no change unless a room was added or deleted but with many of the general use classrooms there was considerable variation from year to year. This points out another very subjective element to such room use studies since most of the classrooms have movable chairs and no attempt was made to estimate the optimum number of student stations that could be placed in each room. In some cases as many as fifteen more chairs could be added without crowding.

Attachments J and K summarize data for fiscal years 1971 through 1974. Attachment J shows the changes in available classrooms during the four years of the study. Such changes were minimal because of the renting of eight classrooms in a Jewish Temple classroom building adjacent to the campus. Attachment J also shows the increase in part-time students which accounts for the decrease in the number of students assigned each hour since the normal full-time student takes twelve to fifteen semester hours compared to three to six semester hours for the part-time student. Attachment K shows the percentage of the student body assigned to classrooms each hour for the four years of the study along with the percentage change from the first year of the summary (1971) to the last year (1974).

In 1975 the President requested a further variation in regard to classroom use. First a listing was developed of all available student spaces on the campus. See attachment I. This was done by actually counting the number of student stations available which as mentioned before is another subjective element with no rule used to define optimum space per student. Then a listing of the available general purpose student stations that were occupied for the semester by each class hour was developed and translated into percentages of use. Attachment L exhibits this presentation. The percentages run higher than the ones developed by using percentages of the student body assigned to classrooms each hour and thus lent themselves easier to justifying the need for more classroom space. For comparison purposes the three methods of showing room use are supplied for the same semester, spring 1976. Attachment L shows the percentage of available general purpose student stations that were occupied, attachments M and N show, respectively, the percentages of the student body assigned to classrooms each hour and the actual number of students assigned to classrooms each hour, and attachment O shows the percentage use of available general use classrooms for the spring semester. Attachment O also gives a comparison between spring 1973 and spring 1976 which again shows decreasing percentages because of the increase in part-time students.

These three methods manipulate the same data in different ways for different purposes. A complex formula could be developed for computer use but in our case we do not have available the computer expertise to develop such a formula. Therefore my question to the group here today is, "How do you present room use data and what modifications can you suggest without involving specialized computer knowledge?"

Room Use

Number of General Use Classrooms: 44
Average Number of Student Stations: 40.9
Percentage of Scheduled Use of General Classrooms, 1973-74: 83%

	Fall, 1973	Spring, 1974	Student Stations
G22	24 hours	31 hours + 1 PCE	45
G24	28 "	33 "	45
A103	36 "	36 "	60
A301	36 "	33 "	45
A302	36 "	36 "	45
A303	29 "	36 "	45
A304	31 "	22 "	45
A305	33 "	33 "	45
A315	33 " + 1 PCE	36 "	45
A316	33 "	33 "	45
S117A	36 "	30 " + 2 PCE	35
S117B	33 "	33 " + 2 PCE	35
S123B	27 "	31 " + 2 PCE	35
S124	33 "	36 " + 1 PCE	45
S125	36 "	36 " + 1 PCE	45
S126	34 " + 1 PCE	36 " + 3 PCE	45
S128	34 " + 1 PCE	30 " + 2 PCE	45
S132	28 " + 2 PCE	33 " + 3 PCE	45
S205	35 "	32 " + 2 PCE	45
S211A	26 " + 1 PCE	32 " + 1 PCE	25
S211B	30 " + 1 PCE	36 " + 2 PCE	25
S212	36 " + 1 PCE	36 " + 1 PCE	45
S214	36 " + 2 PCE	33 " + 1 PCE	45
S216	33 "	26 " + 2 PCE	20
S217	33 " + 4 PCE	30 " + 3 PCE	45
S219A	33 " + 2 PCE	33 " + 3 PCE	35
S219B	33 " + 1 PCE	33 " + 3 PCE	35
S223	36 "	36 " + 3 PCE	45
S224	30 " + 3 PCE	33 " + 4 PCE	45
S225A	29 " + 4 PCE	28 " + 1 PCE	25
S225B	26 " + 4 PCE	36 " + 2 PCE	25
S226	36 " + 4 PCE	35 " + 3 PCE	45
S227	24 " + 4 PCE	28 " + 3 PCE	45
S228	33 " + 3 PCE	29 " + 3 PCE	45
S231	31 " + 4 PCE	31 " + 4 PCE	45
S304	26 "	33 " + 1 PCE	45
S309	33 "	36 "	45
S310	29 "	32 "	45
S311A	33 "	33 "	25
S311B	33 "	30 "	25
S312	33 "	33 " + 2 PCE	45
S313	22 "	32 " + 1 PCE	45
S314	26 "	30 "	45
S316	24 "	28 "	45
	1,379 hours + 43 PCE	1,428 hours + 62 PCE	1,800

Room use based on 40 hour week, 9 a.m to 5 p.m., five days a week. Classrooms are also used up to 10 p.m. four nights a week for other courses sponsored by the Program of Continuing Education.

Ninety hours of yearly total are music courses taught in general classrooms.

Room Use

Semester	Classroom Use	Special Room Use	Total Room Use
Fall, 1970	85%	48%	72%
Spring, 1971	94%	52%	80%
Fall, 1971	75%	57%	70%
Spring, 1972	79%	49%	69%

Decrease in room use reflects addition of rooms in Learning Resources Center plus subdivision of existing classrooms and conversion of rooms into classrooms from other uses. New media labs plus subdivision of existing labs have enabled special room use to meet demand created by increased number of course in speech and science which have been added in the past year.

The above figures are based on our existing 36 hour week for teaching activities in the undergraduate program.

SPRING, 1972
Room Use

Room:	Periods Used:	Room:	Periods Used:	Room:	Periods Used:
Old Auditorium	12	S224	22 (9)	S205	29 (6)
Amohitheatre	22 (3)	S 225A	30 (9)	S 211A	33 (3)
Art Room-400	26 (9)	S 225B	25 (3)	S 211B	27 (12)
Gym	36	S226	28 (12)	S 212	33 (9)
100A - lab	11	S227	23 (9)	S 214	33 (12)
100B - lab	32	S228	25 (9)	S217	36 (9)
105A - lab	9	S231	28 (9)	S 219A	25 (12)
105B - lab	32	S301	32 (6)	S 219B	33 (9)
110 - lab	14 (3)	S304	33 (3)		
205 - lab	29	S309	30		
S101 - lab	12	S310	30		
S102 - lab	20	S 311A	34 (3)		
S123 - music lab	31 (3)	S 311B	29		
S124 - music lab	31	S312	30		
S129 - lab	8	S313	27		
S201 - lab	2	S314	35 (9)		
S204 - lab	10	S316	36 (3)		
S216 - education lab	12	C149	27		
S223 - speech lab	21 (3)	C160	26		
S232 - lab	20	C161	2		
S235 - lab	3	C162	23		
S303 - lab	24	C171	25		
S308 - language lab	19	C323	23		
S317 - lab	6	C328	24 (12)		
S320 - lab	9				
C147 - media lab	14				
C181 - media lab	15				

Room	Per.Us.	Room	Per. Used
G22	28	305	36
G23	8 (6)	306	26
G24	24	315	30
103	33	316	33
213	20	S117A	29
300	36	S117B	29
301	36	S125	28
302	36	S126	29 (6)
303	30	S128	26
304	36	S132	30 (6)

Possible hours available:
79 rooms x 36 hours each week = 2,844
Total use = 1,959 hours
Percentage use = 69%

Classrooms only - 52 x 36 = 1,872 Use = 1,479
Percentage use = 79%

Special rooms only - 27 x 36 = 972 Use = 480
Percentage use = 49%

(0) = number of hours taught in Program of Continuing Education

Student Stations

General Use Classrooms

Rooms with 45 student stations:

G 22
G 24
A 301
A 302
A 303
A 304
A 305
A 315
A 316
S 125
S 126
S 128
S 132
S 205
S 212
S 217
S 223
S 224
S 226
S 227
S 228
S 231
S 304
S 309
S 310
S 312
S 313
S 314
S 316
C 140-I

Other general use classrooms:

A 103	60 stations
S 117 A	35 "
S 117 B	35 "
S 123 A	35 "
S 123 B	35 "
S 211 A	25 stations
S 211 B	25 "
S 219 A	35 "
S 219 B	35 "
S 225 A	25 "
S 225 B	25 stations
S 311 A	25 "
S 311 B	25 "

Total student stations in general use classrooms: 1,770

Laboratories and Special Use Rooms:

A 100 A	(Biology) 20 stations
A 100 B	(Biology) 32 "
A 105 A	(Chemsitry) 24 "
A 105 B	(Art) 24 "
A 110	(Elementary Science) 40 stations
A 300	(Cartography) 24 stations
A 400	(Art) 35 stations
G 23	(Art) 20 "
S 101	(Botany) 32 "
S 102	(Zoology) 16 "
S 124	(Music) 45 "
S 129	(Bacteria-Histology) 32 stations)
S 201	(Electronics) 32 stations
S 204	(Physics) 16 stations
S 214	(Education) 45 stations
S 216	(Education) 20 "
S 232	(Physical Sciense) 32 stations
S 235	(Atomic) 24 stations
S 303	(Physical Chemistry) 30 stations
S 317	(Organic Chemistry) 32 "
S 320	(Analytical Chemistry) 32 "
C 147-K	(Media) 15 stations
C 149-L	(Media) 15 "
C 160-N	(Media) 15 "
C 162-O	(Media) 15 "
C 323-N	(Media) 20 "
C 328-O	(Media) 20 "

Other Special Use Rooms:

S 301	Chemistry Lecture Room 35 stations	
C 161-N	Large Lecture Hall in Learning Resources Center	129 stations
C 171-Q	Small Lecture Hall in Learning Resources Center	92 "

Science Amphitheatre 200 stations
Theatre 1,094 stations
Old Auditorium 450 stations

Total laboratory and special use room stations: 2,707
Theatre and old auditirium should not be scheduled which would leave: 1,163 stations

Total college student stations without theatre and old auditorium: 2,933 stations

Grand total of all student stations available: 4,477

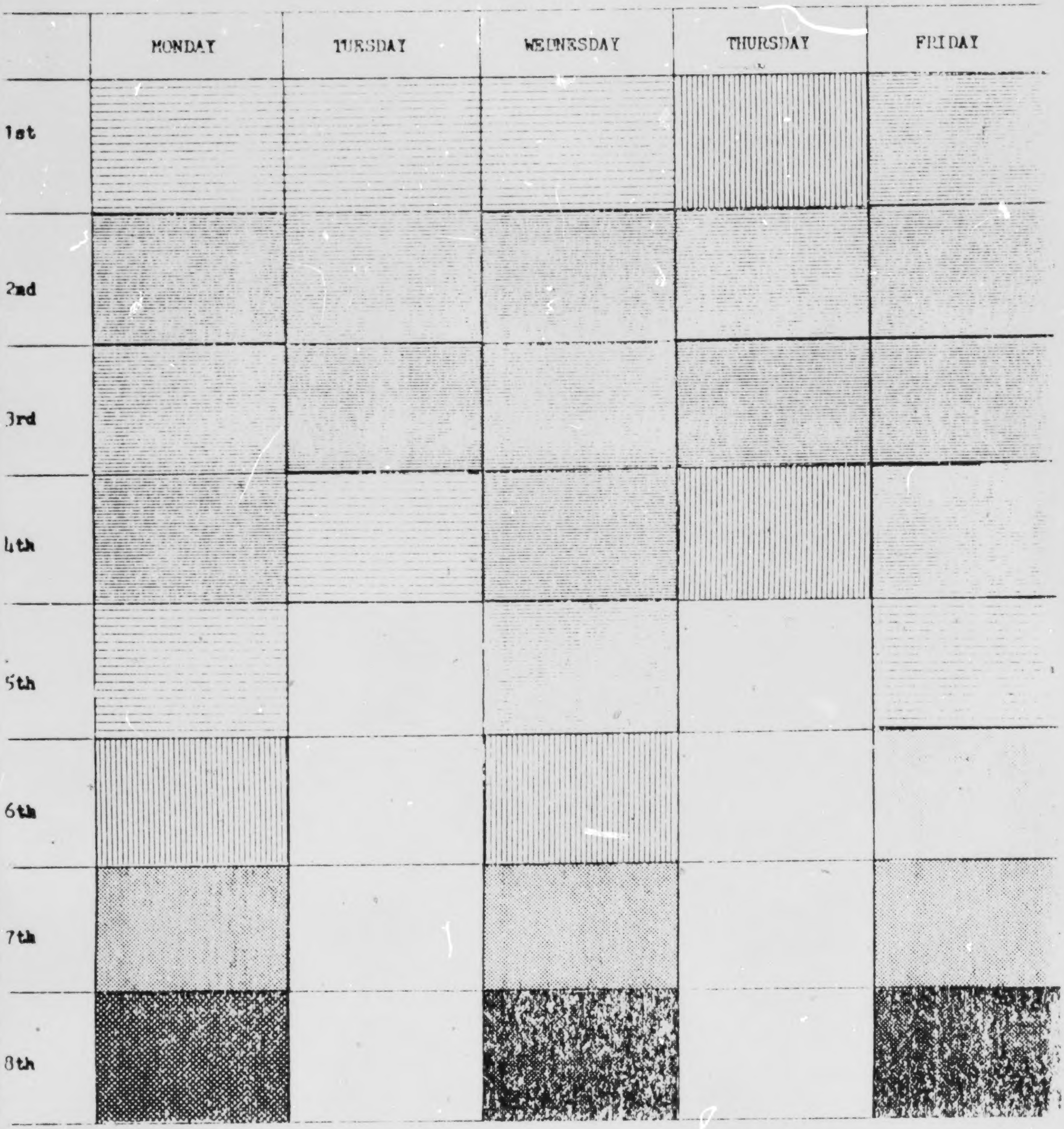
By using the official computer run of October 24, 1975, I have totaled the number of students assigned to classrooms for each hour of the 32 hours used for the bulk of the undergraduate classes of the college. The average number of students assigned to classrooms this semester was 1,324 or 38% of the total student population. Variations ran from 27% above this figure to 75% below it. The attached diagrammatic representation shows the continued low usage in late afternoons. The maximum usage is 2nd through 4th hours on Monday-Wednesday-Friday and the minimum usage is 8th hour. The other attached sheets show the same information in different ways; one shows it by percentage of the whole student body; one by deviation from the average and one simply reports the total number of students assigned to classrooms each hour of each day. This semester, for the first time, the classes on Tuesday and Thursday are 75 minutes in length thus reducing the number of "hours" from 6 on these days to 4.

KEY

▥ 0-9.9% below average
░ 10-19.9% below average
▒ 30-39.9% below average
▓ 60-69.9% below average
█ 70-79.9% below average

▤ 0-9.9% above average
▤ 10-19.9% above average
▤ 20-29.9% above average

Fall, 1975



Divergence from the average of 1,324 students assigned to classrooms each hour. Key is on preceding page.

Percentage of Total Student Body Assigned to Classrooms Each Hour
Fall, 1975

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1st	41%	39%	39%	37%	42%
2nd	48%	45%	48%	45%	48%
3rd	43%	47%	45%	45%	48%
4th	46%	38%	45%	36%	43%
5th	40%		42%		40%
6th	36%		37%		33%
7th	26%		25%		23%
8th	13%		10%		9%

Fall, 1975

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1st	+104	+63	+53	-12	+149
2nd	+363	+260	+359	+256	+352
3rd	+209	+340	+250	+274	+364
4th	+293	+32	+272	-56	+200
5th	+71		+169		+88
6th	-45		-37		-159
7th	-422		-443		[illegible]
8th	-882		-964		-994

Average number of students assigned to classrooms for each hour of the 32-hour week: 1,324

Total number of student body fall, 1975: 3,525

Number of Students assigned to Classrooms fall, 1975, per Official Classroom List October 24, 1975

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1st (6,977)	1,428	1,387	1,377	1,312	1,473
2nd (8,210	1,687	1,584	1,683	1,580	1,676
3rd (8,057)	1,533	1,664	1,574	1,598	1,688
4th (7,361)	1,617	1,356	1,596	1,268	1,524
5th (4,300)	1,395		1,493		1,412
6th (3,731)	1,279		1,287		1,165
7th (2,589)	902		881		806
8th (1,132)	442		360		330
(42,357)	(10,283)	(5,991)	(10,251)	(5,758)	(10,074)

Average - 1,324

Student Spaces

G 24	32 seats
A 301	43 "
A 302	49 "
A 303	50 "
A 304	39 "
A 305	50 "
A 316	44 "
S 117 A	41 "
S 117 B	37 "
S 124	40 "
S 125	45 "
S 126	48 "
S 132	35 "
S 205	43 "
S 211 A	26 "
S 211 B	24 "
S 212	46 "
S 214	38 "
S 216	40 "
S 217	42 "
S 219 A	39 "
S 219 B	33 "
S 223	43 "
S 224	42 "
S 225 A	23 "
S 225 B	27 "
S 226	48 "
S 227	48 "
S 228	37 "
S 231	45 "
S 301	73 "
S 304	52 "
S 309	49 "
S 310	36 "
S 311 A	28 "
S 311 B	22 "
S 312	43 "
S 313	40 "
S 314	31 "
S 316	43 "
L 112	15 "
L 114	15 "
L 116	15 "
L 118	15 "
L 122	15 "
L 304	20 "
L 306	20 "
	1,729 seats
S 128	45 seats

Science Amphitheatre	200 seats	)
Old Auditorium	390 "	)
College Theatre	1,094 "	) = 1,905 seats
L 117 Large Lecture	129 "	)
L 121 Small Lecture	92 "	)

Labs

G 23	12	student	stations	(Art-Sculpture)
A 100 A	20	"	"	(Biology)
A 100 B	32	"	"	(Biology)
A 105 B	24	"	"	(Art)
A 110	40	"	"	(Elementary Science)
A 300	12	"	"	(Cartography)
A 315	24	"	"	(Geology)
A 400	35	"	"	(Art)
S 101	32	"	"	(Botany)
S 102	16	"	"	(Zoology)
S 129	32	"	"	(Bacteria-Histology)
S 201	32	"	"	(Electronics)
S 204	16	"	"	(Physics)
S 232	32	"	"	(Physical Science)
S 235	24	"	"	(Atomic)
S 301	32	"	"	(Analytical Chemistry)
S 303	40	"	"	(Physical Chemistry)
S 308	35	"	"	(Language)
S 317	32	"	"	(Organic Chemistry)
	522	student	stations	

For use purposes:

1,729	general purpose classroom seats
200	seats in Science Amphitheatre
221	seats in two LRC lecture halls.
2,150	seats available for general class use

Room Use 1970-1974

The attached sheet shows the percentage of students assigned to classrooms for fall 1971, fall 1972, fall 1973 and fall 1974 along with the percentage change between fall 1971 and fall 1974. The pattern is consistent with a decreasing percentage of students being assigned to classrooms between 1971 and 1974 except for slight increases in some of the afternoon class hours.

The student body increased 21% from 2,840 students in fall, 1971 to 3,435 students in fall, 1974. The first four classroom hours show decreases in the percentage of students assigned to classrooms for every day in the week while the late afternoon hours show increases in 4 hour out of 16.

Rooms in use:

1971-72

52 classrooms
27 special use rooms (primarily labs)
79

1974-75

51 classrooms (8 rented in Temple)
26 special use rooms (primarily labs)
77

Approximately the same number of rooms are being used by a decreasing percentage of the 21% larger student body.

During the four years, part-time students increased five times from 99 in fall, 1971 to 500 in fall, 1974. The number of credit hours taken by students increased 12% from 43,745.5 in fall, 1971 to 48,993.5 in fall, 1974.

Percentage of Student Body Assigned to Classrooms, Fall 1970-Fall 1974

	MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY	
1971	50%	-9%	50%	-5%	53%	-10%	48%	-8%	50%	-8%
1972	51%		52%		50%		48%		52%	
1973	48%		47%		49%		44%		48%	
1974	41%		45%		43%		40%		42%	
st hour										
1971	61%	-16%	56%	-10%	61%	-12%	55%	-14%	60%	-12%
1972	62%		52%		60%		47%		63%	
1973	50%		46%		53%		46%		49%	
1974	45%		46%		49%		41%		48%	
nd hour										
1971	60%	-11%	64%	-19%	57%	-5%	61%	-16%	57%	-4%
1972	51%		54%		50%		52%		53%	
1973	54%		54%		61%		54%		59%	
1974	49%		45%		52%		45%		53%	
rd hour										
1971	60%	-14%	51%	-9%	58%	-9%	51%	-5%	56%	-9%
1972	53%		54%		58%		50%		58%	
1973	55%		49%		57%		47%		55%	
1974	46%		42%		49%		46%		47%	
th hour										
1971	46%	+3%	48%	-6%	49%	0	49%	-6%	52%	-1%
1972	50%		41%		56%		41%		52%	
1973	49%		44%		57%		43%		55%	
1974	49%		42%		49%		43%		51%	
h hour										
1971	44%	-4%	43%	-2%	44%	-3%	43%	-2%	49%	-6%
1972	45%		38%		47%		37%		46%	
1973	42%		42%		46%		41%		45%	
1974	40%		41%		41%		41%		43%	
h hour										
1971	37%	-6%			32%	-3%			33%	-3%
1972	36%				35%				33%	
1973	34%				36%				34%	
1974	31%				29%				30%	
th hour										
1971	18%	+3%			16%	+3%			15%	+2%
1972	16%				17%				15%	
1973	17%				20%				14%	
1974	21%				19%				17%	
th hour										

Percentage of available general purposes student stations occupied in spring, 1976 per official classroom list, March 15, 1976

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1st	57%	50%	56%	50%	58%
2nd	71%	68.5%	67%	68%	68%
3rd	80%	63%	77%	63%	78%
4th	73%	55%	72%	50%	72%
5th	65%		66%		62%
6th	53%		55%		51%
7th	28%		27%		26%
8th	13%		12%		10%

Average = 55%

Percentage of Total Student Body Assigned to Classrooms Each Hour, Spring, 1976

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1st	39%	34%	38.5%	34%	39%
2nd	48%	47%	46%	47%	47%
3rd	55%	43%	52%	43%	54%
4th	50%	37%	49%	34%	49%
5th	44%		45%		43%
6th	36.5%		37.5%		35%
7th	19%		19%		18%
8th	9%		8%		7%

Number of Students Assigned to Classrooms Spring, 1976, per Official Classroom List March 15, 1976

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1st (5,823)	1,226	1,073	1,211	1,073	1,240
2nd (7,368)	1,521	1,473	1,435	1,468	1,471
3rd (7,760)	1,717	1,357	1,647	1,354	1,685
4th (6,910)	1,567	1,175	1,551	1,077	1,540
5th (4,162)	1,395		1,428		1,339
6th (3,430)	1,147		1,178		1,105
7th (1,749)	594		588		567
8th (751)	276		262		213
37,953)	(9,443)	(5,078)	(9,300)	(4,972)	(9,160)

N 127

Room Usage, Spring 1976

Gym	31	hours/week
Amphitheater	16	" "
G 23 (Art)	11	" "
G 24	26	" "
A100A (Lab)	8	" "
A100B (Lab)	8	" "
A103 (Psych Lab)	24	" "
A105B (Art)	20	" "
A110 (Education)	24	" "
A300 (Cartography)	9	" "
A301	29	" "
A302	29	" "
A303	29	" "
A304	22	" "
A305	27	" "
A315 (Geology)	22	" "
A316	26	" "
A400 (Art)	19	" "
S101 (Lab)	7	" "
S102 (Lab)	18	" "
S109 (Lab)	4	" "
S117A	24	" "
S117B	21	" "
S124	29	" "
S125	26	" "
S126	26	" "
S128	26	" "
S129 (Lab)	2	" "
S132	24	" "
S201 (Lab)	4	" "
S204 (Lab)	11	" "
S205	26	" "
S211A	22	" "
S211B	26	" "
S212	25	" "
S214	14	" "
S216	21	" "
S217	22	" "
S219A	24	" "
S219B	22	" "
S223	29	" "
S224	32	" "
S225A	24	" "
S225B	19	" "
S226	26	" "
S227	31	" "
S228	30	" "
S231	29	" "
S232 (Lab)	13	" "
S235 (Lab)	8	" "
S301	24	" "
S303 (Lab)	19	" "
S304	27	" "
S309	24	" "
S310	24	" "
S311A	22	" "
S311B	23	" "
S312	16	hours/week
S313	24	" "
S314	21	" "
S316	22	" "
S317 (Lab)	3	" "
S320 (Lab)	9	" "
L112	24	" "
L114	24	" "
L116 (Media)	21	" "
L117 (Large Lecture)	12	" "
L118 (Media)	20	" "
L121 (Small Lecture)	29	" "
L122 (Media)	16	" "
L304 (Health Education)	20	" "
L306 (Nursing)	6	" "

73 rooms used for 1,475 hours out of a possible 2,336 (73 x 32) = 63% use.

49 general use classrooms used for 1,169 hours out of a possible 1,568 (49 x 32) = 75% use.

Room Usage by Day and by Hour

Percentage of available general purpose student stations occupied in spring, 1976 and spring, 1973 based on official computer runs of March 15, 1976 and March 9, 1973

	1976	1973
1st Hour	54%	63%
2nd Hour	68%	70%
3rd Hour	72%	69%
4th Hour	64%	74%
5th Hour	64%	64%
6th Hour	53%	60%
7th Hour	27%	41%
8th Hour	12%	16%
Monday	55%	59%
Tuesday	59%	63%
Wednesday	54%	59%
Thursday	58%	62%
Friday	53%	61%
Overall	55%	60%

RAZING FACILITIES FOR FUN AND PROFIT

Eric Brown
New Hampshire College
and University Council

Introduction

This paper is a case study of a private university's efforts to more effectively utilize its facilities in order to reduce physical plan operating expenditures through this increased efficiency of use.

The format used in this case study is a description of the methods a facilities task force used to approach the problem, the analyses which were made of facilities (classroom, academic and administrative space utilization), the recommendations which the task force made, and a review of results stemming from these recommendations a year later.

Background

In the fall of 1974, the President of Brown University appointed a series of task forces to review various components of the institution's operations and make recommendations to him concerning economies which might be achieved or additional revenues which might be generated to assist the University in moving towards a balanced budget. The author of this paper served as Chairman of the Facilities Task Force, one of seven task forces appointed by the President.

The Approach to the Problem

Prior to taking any action, the facilities task force met several times to develop a basic strategy--a strategy which consisted of three elements. First, no space could be removed from the institution's inventory until a clear picture of current space utilization had been determined and this information had been disseminated throughout the entire campus. Second, in addition to creating a climate favorable to improving space utilization, it was also necessary to establish equitable university-wide standards, standards against which all departments could be judged. Finally, there must be a clear demonstration of the savings and/or increased revenues involved if buildings were removed resulting in better utilization of institutional space.

Analysis

To gain a clearer picture of how university space was being utilized, the task force commissioned three studies in cooperation with the Office of Institutional Research: (1) a classroom utilization study; (2) a study of space usage in academic departments; and (3) an analysis of space usage in academic support and administrative departments.

The approach used in the classroom utilization differed from that used in the academic and administrative areas. As a large number of classes were scheduled on an informal basis between faculty members and students, there was little data available on where 30% of the University's classes met. There was, however, accurate information on the individual course enrollment as well as the seating capacity of all classrooms on campus.

Given the data which was available, the method used was to match the actual class enrollments against the potential capacity of the University's classrooms. In theory all that was required to determine if excess classroom space existed was to make a comparison of the potential number of classes at various sizes which could be accommodated with the actual sizes of the classes which had to be accommodated.

In practice, consideration had to be given to classroom "ownership"--the registrar scheduled the general classrooms, the academic departments had restricted classrooms in which they scheduled classes. The number of hours during the week when classes could be scheduled was a second factor. Finally, as it was unrealistic to assume classrooms would be used 100% of the time or that the classrooms would be filled to capacity, what were some reasonable assumptions about classroom utilization?

The solution to the problem was to build a series of models with a large classroom building already removed to see under what assumptions the institution could still operate with enough "slack" space to make scheduling humanly feasible.

Tables 1 and 2 provide the background data for the model. Table 1 includes all general and restricted classrooms, the seating capacity of these classrooms at 80% occupancy with a major classroom building removed, and the capacity at 80% occupancy with one classroom building removed and several dormitory lounges added to the inventory. Table 2 breaks down the class enrollment by size. Table 3 provides an example of one of a number of alternatives developed from the model. In this case, general and restricted classrooms were utilized 75% of the time at an 80% occupancy level of student stations. A major classroom building was removed and dormitory lounges were included. This alternative indicated that it was possible to remove one classroom building from the University's space inventory and still have enough surplus hours to permit flexibility in scheduling.

In the case of the analysis of academic and administrative space, the task force was again faced with scaling down the theoretical to a practical level which was feasible in a short period of time. Ideally, to undertake a complete analysis of academic and administrative space, one would divide space into two categories: (1) the amount of office space required to achieve a suitable environment for the person working in that space; (2) the additional amount of specialized space required to undertake instructional, research, or administrative activities. Having determined the requirements of these categories, one could then further examine the quality of the space and the utilization of this space to assure that an optimum environment existed and was used to its fullest extent.

The academic and administrative study undertaken dealt only with the first category--the amount of office space available to individuals in the various departments of the University. No attempt is made to assess the quality or utilization of this space--the subjective nature of this type of data, the difficulty and expense of collecting this information, and time being the major factors for exclusion of these characteristics. Although non-office space may make up a significant portion of a departments' space, no evaluation was made of this space because of the difficulty in establishing an appropriate method of determining the various space requirements for such activities as research, performing arts, or athletics.

The approach used further assumed that the average office space on campus was adequate for the individual who currently occupies this space, and focuses primarily on those spaces which fall at the two extremes of the spectrum of office space. In addition to the distribution of office space, the office of Institutional Research was also asked to include in the report all shared offices, all members of the faculty/administration having more than one office, and all offices which were vacant at the present time.

To accomplish this task, each department was given a printout from the University's space inventory system and a budget roster which included names and ranks of individuals but excluded salary data. Departments were asked to indicate the office space occupied by each person on the budget roster. University space standards were then developed from these data (see Table 4). A similar table was created for administrative ranks. These standards were then used as a basis for evaluating the way faculty, graduate students and administrators were housed in each department. Table 5 indicates how this evaluation was done. Faculty at each rank who had office space which fell more than one standard deviation above or below the University norm for their rank were indicated as "high" or "low" respectively. The results of each rank were then aggregated to provide a picture of total departmental office space. This picture makes it fairly easy to determine those departments which appear to be poorly housed, e.g., the French Department with 52.9% of its staff housed in the bottom 16% of the University norms for those ranks contained in the department.

Task Force Recommendations

Once copies of these analyses had been distributed to all departments and a public discussion of these analyses had been held, the task force prepared its recommendations based on the preceding analysis. Table 6 provides an overview of these recommendations. The task force identified 150,000 square feet of space or about 10% of the total academic and administrative space as top priority for removal from the University's inventory. The dollar values and space implications for departments involved were also included. Because of the detailed office space data available, it was further possible to state that any displaced department could be given office space equivalent to the average University space. As most of the office spaces contained in these areas were on the low end of the spectrum, this provided additional motivation for departments to consider the moves.

In addition to the recommendation that those buildings in Priority I be closed within a year, the task force also compiled a list of all University held properties which were not used for educational or housing purposes and an estimate of the value of these 38 pieces of property was obtained. The task force recommended that all properties which fell outside the foreseeable areas of institutional expansion be gradually sold off. (A conservative estimate of the value of these properties was in the excess of 1.5 million dollars.)

Epilogue

As more than a year has gone by since the early spring of 1975 when the task force submitted its report, it is now possible to examine the results of this approach to analyzing institutional space needs. In terms of concrete measures, the faculty has adopted a class schedule which permits the offering of classes at a broader range of hours during each week. Of the Priority I list of buildings, one large classroom building has been closed down, although the University has not yet been able to receive permission from the Zoning Board to change the zoning regulations in order to accommodate the planned tenants. Two frame buildings were given to the Providence Historical Society and were removed from University owned property. One building has been sold, and two others are currently rented. In all, about 40% of the Priority I square footage which the task force recommended be removed from the University's inventory has been removed by rental, sale, or "mothballing."

From a subjective point of view, the financial problems coupled with public information about current space usage appear to have created a climate which made these recommendations feasible to implement. It is interesting to note that the discussion of the closing of the remainder of the Priority I buildings as well as the sale of University-owned property outside potential areas of institutional expansion slowed down as the stockmarket rose and the institution received a very generous unrestricted bequest. These factors, in combination with other economies which had been introduced, significantly improved the institution's financial position. The inference to be drawn from these latter events is that implementation of space reduction programs require both data and a high level of perceived benefits by those affected.

Table 1

CLASSROOM DATA

	All			Number at 80% Seat Occupancy (WH[1] excluded)			Number at 80% Seat Occupancy (WH excl, Lounges[2] added)		
Capacity	Gen	Res	T	Gen	Res	T	Gen	Res	T
500+	2		2	2		2	2		2
476-500									
226-250	4		4					1	1
201-225				1		1	1		1
176-200	1		1	3		3	3		3
151-175	1		1						
126-150	2	1	3	2		2	2		2
101-125	2	1	3	2	1	3	2	2	4
91-100				1		1	1	1	2
81-90	2		2	1	1	2	1	4	5
76-80	1		1						
71-75				2		2	2		2
66-70	2		2						
61-65	1	3	4	1		1	1		1
56-60	6		6	1		1	1		1
51-55	2		2	2	1	3	2	2	4
46-50	1	4	5	6	3	9	6	3	9
41-45	1	2	3	2		2	2		2
36-40	25		25	2	3	5	2	3	5
31-35	4	3	7	5	2	7	5	4	9
26-30	5	4	9	6	1	7	6	3	9
21-25	18	14	32	5	7	12	5	8	13
16-20	7	7	14	17	14	31	17	15	32
11-15	4	6	10	4	10	14	4	10	14
6-10	2	3	5	4	5	9	4	5	9
Total	93	48	141	69	48	117	69	61	130

[1] WH = Whitehall

[2] Lounges added to classroom inventory = Grad Center - Rms 129, 214A, & 212S
West Quad - Bigelow & Arnold Lounges
Andrews - Dining Hall, Rms 103 & 106
Metcalf Hall - Rms 115 & 121
Miller Hall - Rm 107
Alumnae Hall - Rms 103 & 104

Source: Working Paper on Classroom Utilization, Carol L. Wooten, Office of Institutional Research, Brown University, October, 1974

Table 2

Number of Classes and Class Hours per Week

Semester I, 1973-74

	Number of Classes			Class Hours		
Capacity	Classes	Sections	Total	Classes	Sections	Total
500+						
476-500	1		1	3		3
⋮						
226-250	5		5	15		15
201-225	4		4	12		12
176-200	8		8	24		24
151-175	5		5	15		15
126-150	4		4	12		12
101-125	17		17	51		51
91-100	5		5	15		15
81-90	8		8	24		24
76-80	7		7	21		21
71-75	15		14	42		42
66-70	2		2	6		6
61-65	9		9	27		27
56-60	9		9	27		27
51-55	14		14	42		42
46-50	11	1	12	33	1	34
41-45	25	7	32	75	7	82
36-40	25		25	75		75
31-35	28	8	36	84	8	92
26-30	32	16	48	96	16	112
21-25	56	39	95	168	39	207
16-20	110	50	160	330	50	380
11-15	145	28	173	435	28	463
6-10	159	7	166	477	7	484
2-5	102		102	306		306
Total	805	156	961	2,415	156	2,571

Source: Working Paper on Classroom Utilization, Carol L. Wooten, Office of Institutional Research, Brown University, October, 1974

Table 3

Case 5

Assumptions:
-- 75% scheduling of
33 hr/wk generals
24 hr/wk restricted
-- 80% occupancy of CRS
-- Residence Lounges added
-- WH excluded

Capacity	G	R	Tot	Tot CR Hrs- Tot CL Hrs	Cum. Freq. (Surplus) Tot CR Hrs
500+	66		66	63	840
476-500	–		–		
⋮					
226-250		18	18	3	777
201-225	33		33	21	774
176-200	99		99	75	753
151-175	–		–	-15	678
126-150	66	36	102	54	693
101-125	66	36	102	51	639
91-100	33	18	51	36	588
81-90	33	72	105	31	552
76-80	–		–	-21	471
71-75	66		66	60	492
66-70	–		–	-6	432
61-65	33		33	6	438
56-60	33		33	6	432
51-55	66	36	102	60	426
46-50	198	54	252	218	366
41-45	66		66	-16	148
36-40	66	54	120	45	164
31-35	165	72	237	145	119
26-30	198	54	252	140	-26
21-25	165	144	309	102	-166
16-20	561	270	831	451	-268
11-15	132	180	312	-151	-719
6-10	132	90	222	-262	-568
2-5	–		–	-306	-306
Total	2277	1098	3375	840	

Source: Working Paper on Classroom Utilization, Carol L. Wooten, Office of Institutional Research, Brown University, October, 1974

Table 4

OFFICE SPACE, ACADEMIC DEPARTMENTS, 1973-74 ACADEMIC YEAR

FACULTY	Professors	Associate Professors	Assistant Professors	Instructors	Lecturers	Professors Emeriti	Assistant Professors Research
Median (sq.ft.)	177.0	159.0	134.0	108.0	72.5	154.0	154.5
Mean (sq.ft.)	188.9	176.2	149.6	128.7	95.8	160.1	143.0
S.D.	66.4	56.6	59.1	60.9	60.7	73.0	46.0
Range (sq.ft.)	52-464	60-321	40-345	56-240	20-210	71-304	37-225
Total Square Feet	46,852	14,270	17,199	1,416	1,245	2,242	1,573
N	248	81	115	11	13	14	11

STAFF	Administrative Assistants	Research Associates	Research Assistants	Secretaries
Median (sq.ft.)	101.4	80.0	76.0	121.8
Mean (sq.ft.)	117.9	93.3	83.4	143.6
S.D.	44.5	40.7	57.8	78.3
Range (sq.ft.)	40-192	37-179	20-210	40-411
Total Square Feet	2,712	2,706	1,001	11,918
N	23	29	12	83

GRADUATE STUDENTS	Teaching Assistants	Assistants	Fellowships	Research Assistants	Self Support
Median (sq.ft.)	58.0	50.8	41.6	51.5	53.5
Mean (sq.ft.)	63.4	61.4	54.8	64.2	58.0
S.D.	38.3	36.0	40.4	42.1	16.6
Range (sq.ft.)	24-177	19-231	19-207	24-291	31-85
Total Square Feet	1,585	12,288	2,245	6,035	870
N	25	200	41	94	15

Source: Space Utilization Analysis of Academic Departments, Celeste F. Griffen and Carol L. Wooten, Office of Institutional Research, Brown University, December, 1974

Table 5

OFFICE SPACE, ACADEMIC DEPARTMENTS, HIGH LOW RANGES, 1973-74 ACADEMIC YEAR

	Faculty														Staff								Graduate Students															
	Prof		Asoc Prof		Asst Prof		Inst		Lect		Prof Emer		Asst Prof Rsch		Admin Asst		Rsch Asoc		Rsch Asst		Sec'y		Teach Asst		Asst		Fell-shps		Rsch Asst		Self Supp		Total		Total N in Ranks	% H	% L
HUMAN	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L			
Art																							1			5							1	5	15	6.7	33.3
Class	1	3																			1				2								4	3	14	28.6	21.4
Co Lit		2	1																														1	2	9	11.1	22.2
English		7		4		4																3	2		13								15	18	83	18.1	21.7
French	1	1	1	1		1		1																									2	4	21	9.5	19.0
German	1	1	1																							8							2	9	17	11.8	52.9
Hisp & It	2	1				1																		3		6							2	11	18	11.1	61.1
Ling	1	1		1	2																												3	2	11	27.3	18.2
Music	1		4		4																											2	9	2	17	52.9	11.8
Philos					1																				2								3		21	14.3	
Rel St	2		1																													1	3	1	17	17.6	5.9
Slavic	1	1	1																														2	1	14	14.3	7.1
Th Arts				1					1																								1	1	7	14.3	14.3
Total	10	17	9	7	7	6		1	1												1	3	3	3	17	19						3	48	59	264	18.2	22.3
SOC SCI																																					
Anthro	1	1			1																												2	1	13	15.4	7.7
Asian		1																							2								2	1	6	33.3	16.7
Econ			1		1																1	3											3	3	47	6.4	6.4
Educ	1		1		3		1														2												8		8	100.0	
Egypt	1																																1		2	50.0	
Hist of Ma	1										1																						2		5	40.0	
History	4	2		1	1	1										1						1											5	6	32	15.6	18.8
Poli Sci	2				3												1				2										1		9		23	39.1	
Sociol	3	1	1		1	2								1			1	1	1		1		1	1		3	4	3		1			13	13	57	22.8	22.8
Total	13	5	3	1	10	3	1				1			1		1	2	1	1		6	4	1	1	2	3	4	3		1	1		45	24	193	23.3	12.4

Source: Space Utilization Analysis of Academic Departments, Celeste F. Griffen and Carol L. Wooten, Office of Institutional Research, Brown University, December, 1974

Table 6

peration and ustodial Cost	Build. No.	Total Area	Non-assignable Area	Building Users	Rent*	Close*	Demol*	Sell*	Rental Price	Annual Income
$ 27,995	BW49	25,087	6,536	Classrooms; Applied Math	Yes 1	Yes 2	Yes 3	--	3.5/sq.ft.	$ 87,805
7,710	BN46	3,690	1,420	Brown University Press	Yes 2	Yes 3	--	Yes 1	300/mo.	3,600
10,340	CI72	7,305	3,422	Inst. for Life Sciences; Sociology	Yes 1	Yes 2	--	--	300/mo.	3,600
5,915	BV53	2,142	487	Math; Credit Union	Yes 1	Yes 2	--	--	275/mo.	3,300
1,750	DI32	3,459	1,210	Vacant	Yes 1	Yes 2	--	--	275/mo.	3,300
7,560	DG40	3,436	1,142	History; Philosophy; Summer Programs	Yes 1	Yes 2	Yes 3	--	300/mo.	3,600
10,760	DG44	4,980	1,451	Brown Student Agencies	Yes 1	Yes 2	Yes 3	--	275/mo.	3,300
17,550	EM50	24,599	8,158	Bio-Med; Classrooms (4)--2 large lecture	--	Yes 1	--	--	--	--
8,485	CP69	7,378	1,765	Meeting Street School; Classrooms	Yes 1	Yes 2	--	--	4/sq.ft.	33,940
48,285	HA50	64,993	13,580	University Library System	--	Yes 1	--	--	--	--
9,500	DR45	6,032	1,317	Photo Lab	Yes 1	Yes 2	--	--	275/mo.	3,300
$155,850		153,101	40,488							$145,745
17,310	DK27	12,182	3,426	Physical Education	--	Yes 1	--	--	--	--
18,660	DK31	14,421	2,927	Career Dev.; HERS; Pembroke Library	--	Yes 1	--	--	--	--
8,450	HI50	6,131	3,046	Music	Yes 1	Yes 2	--	Yes 3	275/mo.	3,300
12,600	HG51	9,107	3,214	Music	Yes 1	Yes 2	--	Yes 3	350/mo.	4,200
$ 57,020		41,841	12,613							$ 7,500
21,790	EM52	18,975	4,943	Security Dept.; Copy Center; Classrooms	--	Yes 1	--	--	--	--
10,100	EU53	6,914	2,395	Modern Lang.; Applied Math; Urban Ovserv.	Yes 1	Yes 2	--	--	3.5/sq.ft.	24,199
$ 31,890		25,889	7,338							$ 24,199
$244,760		220,831	60,439							$177,444

*Numbers after "Yes" indicate priority of action.

O.I.R.
11/26/74

RATINGS OF THE ACADEMIC PROGRAM BY FRESHMAN STUDENTS IN "SYSTEMATICALLY DESIGNED" AND "CONVENTIONAL" COURSES: A DISCRIMINANT ANALYSIS

Ernest T. Pascarella and Patrick T. Terenzini
Syracuse University

Abstract

The purpose of this exploratory study was to determine whether freshman students enrolled in two or more of seven courses which had been systematically designed by faculty teams differed from students not taking these courses in their attitudes toward their academic and non-academic experience. A stepwise discriminant analysis indicated that a factor dimension termed Interest Value best distinguished between the two samples. Freshmen taking two or more "systematically designed" courses rated their academic program in a significantly more positive direction on this dimension that did students not enrolled in these courses. The findings suggest that systematic instructional development efforts may have positive impacts beyond the course level.

The literature on experimental, innovative and non-traditional instruction in higher education has grown rapidly since the mid-1960's. One level of research in this area has dealt with student responses to very specific instructional technologies, e.g., television and computer-assisted instruction (Mathis, Smith and Hansen, 1970; Davis, Johnson and Dietrick, 1969; Menne, Hannum, Klingensmith & Nord, 1969), or instructional systems, e.g., the auto-tutorial system (Postelthwait, Novak & Murray, 1964) and the "Keller Plan" or Personalized System of Instruction (Keller, 1968; Riner, 1972; Roth, 1973; and Smith, Grey & McCauley, 1973). A second level of research in this area has focused on the evaluation of curricular or instructional experiments involving entire institutions (e.g., Gaff, 1970; Morgan, 1972) or major units within an institution larger than a department (e.g., Siebel, 1973; Stakenas, 1972).

Little research, however, appears to have focused on the relationship between exposure to experimental/non-traditional instruction at the course level and student attitudes toward more global aspects of college such as the quality of the academic program in general. The purpose of this study was to determine whether freshman students enrolled in courses which had been systematically designed by faculty teams working with an on-campus instructional development center differed from students not taking these courses in ratings of their academic program, ratings of their non-academic life, amount of informal interaction with faculty and degree of involvement in extracurricular programs. The importance of such research is twofold. First, it is aimed at determining the extent to which systematically designed instructional efforts may have impact beyond the course level; and second, it explores the potential impact derived from establishing units which institutionalize those efforts.

Methodology

Sample

The setting for the study was Syracuse University, a large, private university with a total undergraduate enrollment of approximately 10,000 students located in Central New York State. A simple random sample of 500 freshmen was drawn by computer from the population of freshmen enrolled in the College of Arts and Sciences at that institution. The Arts and Science population from which the sample was drawn was approximately 54% male and 46% female, as estimated at the beginning of the spring 1975 semester.

Instrument

As a measure of their ratings of their academic program, students were asked to rate the statement "I HAVE FOUND MY ACADEMIC PROGRAM AT S.U. TO BE:" on the Adjective Rating Scale (ARS) (Kelly and Greco, 1975). The ARS consists of twenty-four adjectives (e.g., good, enjoyable, demanding, boring, useless, practical, different, interesting, dull) against which the respondent rates certain specific statements using the following four-point scale: 1 = extremely, 2 = very, 3 = somewhat, 4 = not at all. Technical information on the reliability and validity of the ARS is available on request.

Additional items on the instrument asked students to estimate both the number of times during the semester they had met informally with faculty members for ten minutes or more and the approximate number of extracurricular activities in which they had participated during the year.

Students were asked to indicate whether they had taken, or were presently enrolled in, any of seven large undergraduate courses which had been developed by faculty teams working in collaboration with an on-campus instructional development unit. The development of each course required from six to twelve months before the initial field testing. This typically included a four- to eight-week intensive summer period in which the faculty team was paid full-time to work with a professional developer in the design and preparation of the course for the academic year. A more detailed description of the general process followed in the development of each course is found in Diamond, et. al. (1975).

Students were classified in the "systematic design" group if they had taken, or were currently enrolled in, two or more of the seven courses. Those respondents who indicated that they had not taken, or were not presently enrolled in, any of the seven courses were classified as a "conventional" group. (It should be noted that the word "conventional" in the present study is intended only for classification purposes. Clearly it may not be the most appropriate term for all the courses to which students in the conventional group have been exposed.

Response

The questionnaire was distributed by mail to the entire sample in March of 1975, usable responses being obtained from 379 subjects (75.8%). The representativeness of the sample was indicated by two factors: the high rate of response to the questionnaire, and a chi-square analysis indicating non-significant differences between the distribution of responding males and females and the distribution of males and females in the population. Forty-six respondents indicated that they had taken two or more of the specified courses and thus constituted the systematic design group. One-hundred twenty-seven respondents had not taken any of the seven courses. These individuals formed the conventional group. From this latter group, 46 subjects were randomly selected to give equal N's in both comparison groups and to permit later use of the remaining 81 subjects in the conventional group for cross-validation purposes. Subsequent tests indicated that the sub-sample of 46 "conventional" students was representative of the group as a whole (details available upon request).

Additional tests indicated non-significant differences between the systematic design and conventional groups with respect to: 1) sex; 2) expected major; 3) Clark-Trow typology choice; 4) rank-ordering of four educational goals; and 5) verbal and quantitative Scholastic Aptitude Test (SAT) scores.

Statistical Analysis

Principal components factor analysis with varimax rotation of components having eigenvalues $\geq$ 1.0 (Kaiser, 1959) was used to identify the underlying dimensions of students' ARS ratings of their Academic Program and their Non-Academic Life. A separate analysis was done for each statement. Factor scale scores, using variables with rotated loadings $\geq$ .40, were computed for each student. This method was chosen rather than a complete estimation method in which all variables, regardless of their factor loadings, are used in order to increase the internal consistency (alpha) reliability of the individual factor scales (Armor, 1974). Such a procedure, however, may result in the loss of orthogonality and lead to substantial inter-scale correlations. The authors judged it preferable to optimize the internal consistency reliability of each scale despite the potential loss of orthogonality since the latter situation can be dealt with effectively by employing multivariate procedures, specifically discriminant analysis.

The factor scales scores derived from respondents' ratings of their academic program and their non-academic life were combined with their number of informal interactions with faculty and their participation in extracurricular activities. These variables formed the basis of a two-group stepwise discriminant function analysis (Cooley and Lohnes, 1971). The criterion for controlling the stepwise selection of variables for inclusion in the analysis was the minimization of Wilk's Lambda. The minimum F-ratio to enter the analysis was set at 1.0. Subsequent to discriminant analysis, a classification analysis based on the pooled covariance matrix and individual discriminant scores was used to assess the efficacy of the discriminant function obtained. In order to cross-validate the discriminant analysis classification was performed both for the 92 subjects on whose scores the discriminant function was derived, and for the remaining 81 subjects from the conventional sample whose scores were not included in the computation of the discriminant function.

Results

Factor analysis of students' ARS ratings of their academic program and their ARS ratings of their non-academic life yielded five factors and four factors respectively with eigenvalues ≳ 1.0. The composition of these two sets of factors are shown in Table 1. The alpha (internal consistency reliability) coefficients and the percentage of explained variance accounted for by each factor are also shown. Each factor has been given a tentative name which was felt to represent the underlying psychological construct tapped. The reader is cautioned, however, against attributing surplus meaning to the factors beyond the scales which characterize them.

Table 2 displays the means, standard deviations and univariate F-ratios for each of the predictor variables. Significant univariate F-ratios were found on two factors from students' ARS ratings of the academic program, Interest Value and Practical Appeal. The systematic design group rated the academic program in a significantly more positive direction on both dimensions than did the conventional course group (recall the ARS is scored 1 = extremely, 2 = very, 3 = somewhat, 4 = not at all).

The results of the stepwise discriminant analysis are also shown in Table 2. As indicated, 5 variables entered the analysis with an F-ratio to enter ≥ 1.0. The discriminant function based on those 5 variables yielded a chi-square value of 13.79 with 5 degrees of freedom, significant at the .025 level. Inspection of the standardized discriminant function coefficients indicates that three factors derived from students' ARS ratings of the academic program contributed most to the discrimination between the systematic design and conventional groups. As indicated by the change in Rao's V, however, only Interest Value (Academic Program) made a statistically significant contribution to the discrimination between the two groups when it entered the analysis. The amount of informal interaction with faculty and the Practical Appeal factor from students' ARS ratings of their non-academic life appeared to contribute less to the discrimination than the three academic variables.

In the classification analysis, 69.6% of the total sample of 92 subjects, on whose scores the discriminant function was derived, were correctly classified;

TABLE 1

VARIMAX ROTATED FACTOR LOADINGS FOR STUDENTS' ADJECTIVE RATING SCALE RESPONSES (N=379)*

I HAVE FOUND MY ACADEMIC PROGRAM AT S.U. TO BE:

FACTOR	LOADING
INTEREST VALUE	
Enjoyable	.78
Exciting	.76
Stimulating	.74
Enlightening	.71
Interesting	.67
Rewarding	.66
Good	.62
Provocative	.58
Informative	.54
Alpha Reliability = .90 % Variance = 23.1%	
DULLNESS APATHY	
Irrelevant	.75
Dull	.71
Boring	.66
Useless	.65
A Waste	.62
Alpha Reliability = .85 % Variance = 14.1%	
PRACTICAL APPEAL	
Necessary	.74
Practical	.60
Valuable	.58
Worthwhile	.51
Relevant	.44
Alpha Reliability = .82 % Variance = 11.0%	
DIFFICULTY/CHALLENGE	
Demanding	.86
Difficult	.85
Challenging	.69
Alpha Reliability = .78 % Variance = 9.3%	
UNIQUENESS	
General	-.70
Different	.55
Alpha Reliability = .27 % Variance = 4.7%	

Total Variance Explained = 62.2%

I HAVE FOUND MY NON-ACADEMIC LIFE AT S.U. TO BE:

FACTOR	LOADING
INTEREST VALUE	
Exciting	.84
Enjoyable	.81
Good	.78
Interesting	.72
Stimulating	.71
Rewarding	.71
Enlightening	.67
Boring	-.63
Worthwhile	.61
Dull	-.60
Valuable	.59
Provocative	.57
Alpha Reliability = .94 % Variance = 27.7%	
PRACTICAL APPEAL	
Irrelevant	-.72
Useless	-.71
A Waste	-.70
Relevant	.63
Practical	.54
Informative	.54
Necessary	.49
Alpha Reliability = .84 % Variance = 17.7%	
DEMAND/CHALLENGE	
Demanding	.78
Challenging	.75
Difficult	.74
Different	.42
Alpha Reliability = .69 % Variance = 9.6%	
UNNAMED	
General	.70
% Variance = 5.5%	

Total Variance Explained = 60.5%

*The complete factor matrix and related information are available upon request.

TABLE 2

MEANS, STANDARD DEVIATIONS, UNIVARIATE F RATIOS AND RESULTS OF STEPWISE DISCRIMINANT ANALYSIS (MINIMUM F TO ENTER SET AT 1.0)

	VARIABLE	SYSTEMATIC DESIGN (N=46)		CONVENTIONAL (N=46)		F RATIO[a]	CHANGE IN RAO's V[b]	STANDARDIZED DISCRIMINANT WEIGHT
		M	SD	M	SD			
STEP	VARIABLES IN THE ANALYSIS (F to ENTER > 1.0)							
1	INTEREST VALUE (ACADEMIC PROGRAM)	2.53	.56	2.81	.46	7.05**	7.05**	.92
2	DULLNESS/APATHY (ACADEMIC PROGRAM)	3.33	.50	3.34	.43	0.04	3.18	.64
3	INFORMAL INTERACTION WITH FACULTY	3.46	4.14	4.04	7.66	0.19	1.79	.37
4	PRACTICAL APPEAL (ACADEMIC PROGRAM)	2.38	.57	2.64	.47	6.00*	1.52	.61
5	PRACTICAL APPEAL (NON-ACADEMIC LIFE)	1.80	.48	1.76	.45	0.14	1.79	-.39
	VARIABLES NOT IN THE ANALYSIS (F TO ENTER < 1.0)							
	DIFFICULTY/CHALLENGE (ACADEMIC PROGRAM)	2.42	.62	2.52	.64	0.59		
	DEMAND CHALLENGE (NON-ACADEMIC LIFE)	2.85	.59	2.91	.55	0.24		
	EXTRA CURRICULAR ACTIVITIES	3.87	7.59	2.17	3.67	1.86		

[a] Degrees of Freedom = 1 and 90

[b] Indicates incremental increase in discrimination due to that variable.

*$p < .025$

**$p < .01$

56.8% of the 81 conventional subjects used to cross-validate the function were also correctly classified. The overall correct classification, including the cross-validation group, was 63.6%. This represented a 27.2% improvement over chance.

These results were supported by a comparison of the percentages of respondents in each group who ranked their "academic work" first or second, from a choice of six possible areas of campus life, as a source of personal satisfaction during their freshman year. In the systematic design group 63% of the students ranked their "academic work" either first or second with 23.9% ranking it first and 39.1% ranking it second. This compared with 43.5% in the conventional group who ranked their "academic work" either first or second as a source of personal satisfaction with only 9.7% ranking it first and 38.3% ranking it second. A Mann-Whitney Test was carried out for the rankings of the two groups on this item. The mean rank for the systematic design group was 2.26 while the mean for the conventional group was 2.73. A z value of 2.03 was obtained, significant at $p < .05$.

Additional Analysis

In order to determine possible differences between the systematic design and conventional groups on personality variables and initial expectations of the college environment, a post-hoc analysis was conducted using the Activities Index (AI), a measure of personality needs, and the College Characteristics Index (CCI), a measure of perceived environmental press. Both instruments are administered to all incoming freshmen shortly before arrival on campus. Thus, students' responses on the College Characteristics Index may be regarded as their expectations of the institution's environment. A separate stepwise discriminant analysis was conducted on the available AI and CCI scale scores of the systematic design and conventional samples. Data was available for 39 of the systematic design subjects and 38 of the conventional subjects. In neither analysis was the discriminant function significant at $p < .05$.

Conclusions and Discussion

The findings of this study suggest that students enrolled during their freshman year in two or more systematically designed courses tend to have significantly more positive attitudes toward their overall academic program on a dimension termed Interest Value than do freshmen not enrolled in these courses. A review of the variables loading high on the Interest Value factor of the ARS suggests that this dimension has both cognitive and affective components. This conclusion is prompted by the high loadings on such cognitive-related adjectives as Enlightening, Interesting, and Informative; and the high loadings for such affect-related adjectives as Enjoyable, Exciting, and Stimulating. The structure of this factor and the more positive ratings of students who took two or more systematically designed courses strongly suggest that these courses have not only a greater attraction for students but also that the attraction is broadly based in terms of the intellectual and emotional make-up of students. Exactly how such courses might lead students to be more favorably disposed toward their freshman academic experience than conventional courses is more difficult to explain. The most evident--and indisputable--commonality of the seven courses is that they were all developed by teams of faculty members working closely with an instructional development agency on the Syracuse University campus. The process affords faculty members the time, professional assistance and financial support necessary to effect a rigorous re-evaluation of educational and instructional philosophies, course content and instructional style. It is quite possible that the cumulative effect of this type of support can be associated with measurable differences in broad based instructional or attitudinal outcomes for students. But while such a result may be intuitively plausible, it cannot be substantiated on the basis of the research reported here.

Moreover, the _ex post facto_ nature of survey research makes the causal attribution of results difficult because of the myriad student, faculty, and contextual variables which may interact to influence instructional quality and outcomes. Clearly, a number of alternative hypotheses may be advanced to explain the study results.

For a substantial number of freshmen, the structure of many of the systematically designed courses may have been sufficiently different from the kinds of instruction typically received that they perceive themselves to be in an experimental situation and therefore work harder and find the course more intellectually and personally stimulating.

This "Hawthorne Effect" may have held to some degree for faculty as well. The fact that the instructional development process frequently involves faculty with an intensive analysis of their assumptions about the structure of teaching and learning might conceivably reinforce an increased sensitivity to the quality and effectiveness of their own in-class teaching behaviors, particularly in a course in which they have invested considerable time and energy.

At the same time, a self-selection process may be present. As a group, faculty members who participated in the redesign process may represent some of the institution's most effective and provacative teachers. Thus, the systematic design group may have responded more favorably to the academic program than their classmates in the conventional group, not so much because of the particular instructional design of the courses in which they were enrolled, but rather because their enrollment in these specific courses involved a greater probability of exposure to individually good teachers.

Perhaps the most valid explanation is one which posits the potential interaction between course instructional design and effective teaching. It seems entirely possible that students in these courses may be responding to an instructional gestalt in which the course design and instructional format amplify the faculty member's most effective teaching behaviors.

But the findings might also be the result of significant variations in student characteristics. Although the systematic design and conventional student groups appear quite homogeneous in terms of such variables as sex distribution, expected major, orientation toward college, educational goals, and academic aptitude, the fact that students by and large "self-selected" themselves into these groups rather than being randomly assigned makes it at least possible that other variables, such as the students' cognitive style, may have accounted for a significant portion of the observed sample differences.

The study is limited in the degree to which the relationship between attitudes toward instruction and actual student behaviors (such as academic achievement and attrition) is left unexplained. Despite this limitation, however, evidence does exist to suggest that the attitudes toward instruction developed during the freshman year are critical in providing a foundation for the student's subsequent openness to the impacts of college (e.g., Wallace, 1966; Katz and associates, 1968).

The linkage which the study tentatively identifies between course design and students' broader perceptions of their academic program has several clear and significant implications both for the area of instructional development and for research on the impact of college on students. The results suggest that systematically designed courses *do* make a difference; however, ferreting out the most significant elements in such courses may require the adoption of experimental (or quasi-experimental) designs.

The nature and extent of the interaction between the instructional development process and teacher performance also needs to be more clearly delineated. If the instructional development process makes a difference, to *whom* does it matter? Are the differential results obtained from student groups attributable more to restructured course content? to varied instructional delivery systems? to enhanced faculty performance? or, as seems more likely, to interaction among these variables? Does the instructional development process benefit students directly? Or are the benefits students derive mediated through the involvement of faculty members in the course development process, student benefits being, therefore, of a second and different order?

In many respects, this study raises at least as many questions as it answers. But it also tentatively establishes a link between freshman students' exposure to systematically designed courses and more positive attitudes toward their academic program.

REFERENCES

Armor, D. J. "Theta Reliability and Factor Scaling." In H. L. Costner (Ed.) Sociological Methodology 1973-1974, San Francisco: Jossey-Bass, Inc., Publishers, 1974.

Cooley, W. W. and Lohnes, P. R. Multivariate Data Analysis, New York: John Wiley and Sons, Publishers, 1971.

Davis, R.; Johnson, C.; and Dietrich, J. "Student Attitudes, Motivations Shown to Influence Reception to Televised Lectures," College and University Business, 1969, 46, 59-63.

Diamond, R. M.; Eickmann, P. E.; Kelly, E. F.; Holloway, R. E.; Vickery, R. R.; Pascarella, E. T. Instructional Development for Individualized Learning in Higher Education, Englewood Cliffs, N. J.: Education Technology Publications, 1975.

Gaff, J. The Cluster College, San Francisco: Jossey-Bass, Inc., Publishers, 1970.

Kaiser, H. F. "Computer Program for Varimax Rotation in Factor Analysis." Educational and Psychological Measurement, 1959, 19, 413-20.

Katz, J. and Associates. No Time for Youth: Growth and Constraint in College Students, San Francisco: Jossey-Bass, Inc., Publishers, 1968.

Keller, F. S. "Good-bye, Teacher--." Journal of Applied Behavioral Analysis, 1968.

Kelly, E. F. and Greco, T. Technical Manual on the Adjective Rating Scale, Syracuse, New York: Center for Instructional Development, 1975.

Morgan, G. A. "Effects of a Less Prescriptive Student Centered College Curriculum on Satisfaction, Attitudes and Achievement." Paper presented at the annual meeting of the American Psychological Association, Honolulu, Sept., 1972.

Mathis, A.; Smith, T. and Hansen, D. "College Students' Attitudes Toward Computer-Assisted Instruction," Journal of Educational Psychology, 1970, 61, 46-51.

Menne, J. W.; Hannum, T. E.; Klingensmith, J. E. and Nord, D. "Use of Taped Lectures to Replace Class Attendance." A. V. Communications Review, 1969, 17, 42-46.

Postelthwait, S. N.; Novak, J. and Murray, H. An Integrated Experience Approach to Learning, With Emphasis on Independent Study, Minneapolis: Burgess, 1964.

Riner, J. "Individualizing Mathematics Instruction." *American Mathematics Monthly*, 1972, 79, 77-86.

Roth, C. H. Jr. "Continuing Effectiveness of Personalized Self-Paced Instruction in Digital Systems Engineering." *Engineering Education*, 1973, 63, 447-50.

Siebel, C. C. "Courses and a Plus--An Innovative Program for Undergraduates: Fourth Year Evaluation." Paper read at the annual meeting of the National Association of Women Deans and Counselors, Cleveland, April, 1973.

Smith, A. B.; Grey, R. K. and McCauley, M. H. "Self-Paced Instruction and College Student Personalities." *Engineering Education*, 1973, 63, 435-40.

Stakenas, R. G. "Student-Faculty Contact and Attitude Change: Results of an Experimental Program for College Freshmen." In K. A. Feldman (Ed.) *College and Student: Selected Readings in the Social Psychology of Higher Education*, New York: Pergamon Press, 1972, pp. 473-81.

Wallace, W. L. *Student Culture: Social Structure and Continuity in a Liberal Arts College*, Chicago: Aldine, 1966.

ACADEMIC OUTCOMES OF A COMPENSATORY PROGRAM AT FOUR SENIOR COLLEGES OF THE CITY UNIVERSITY OF NEW YORK

Judith Piesco, Lawrence Kojaku, Lou Genevie and Lawrence Podell
City University of New York

In response to the change in emphasis, following publication of the Coleman Report, from equal educational opportunity to equal educational outcomes, programs of compensatory education were developed at every level of education throughout the country. The program entitled "Search for Education, Elevation and Knowledge," or SEEK, begun in 1966 by the City University of New York (CUNY), was one such program. SEEK was designed to help disadvantaged New York City high school graduates successfully complete a college education at senior colleges of CUNY. (CUNY is a tuition-free system, consisting of ten senior and eight community colleges, supported by City and State funds.)

Applicants who were eligible for admission to SEEK far exceeded the number of available openings. A random selection was performed (by computer) to determine which students from the eligible pool would be accepted into SEEK. Rejected SEEK applicants usually did not have the qualifications to enter the senior colleges.

With the onset of open admissions in 1970, students who were previously deemed unqualified for entry, were now admitted to the senior colleges. These included applicants who, though eligible for admission to SEEK, were denied it by random procedures; many of them entered the senior colleges anyway. The opportunity for comparative assessment of performance was thereby created.

SEEK Program

The SEEK program is a compensatory education program for educationally, economically and socially disadvantaged students at the City University of New York. It was implemented in 1966. The program currently operates within the framework of the Higher Education Opportunity Act of the New York State Education Law.

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[1] In September, 1976 tuition was imposed at CUNY. However, during the period of time covered by this paper, the university was tuition free.

According to its designers, the program is intended "(to) equalize the opportunity for admission, and to facilitate advance into the college mainstream, through to graduation, of...economically, educationally and socially-deprived students, (and) special funding was authorized for recruitment, counseling, tutoring, remediation, and stipends." Its major educational goal is assisting "students to gain entry into the mainstream of the 'regular' student body and the 'regular' college curriculum." (Annual Report on the SEEK Program, 1971-72, pp. 1-2.) The special features of SEEK (e.g., small class size, low ratios of students to counselors and tutors, and financial aid) are intended to facilitate the objectives of the program.

The extent to which the SEEK program, with its emphasis upon compensation for past disadvantages, has provided the outcomes sought by its designers has not been established through systematic empirical study. In the past, such studies could not be conducted because of the lack of a comparable group of students at the senior colleges of CUNY. However, with the advent of open admissions, similar students have enrolled and progressed, without the special compensatory enrichments of the SEEK program. The issue is whether as many have progressed as far as fast as the SEEK students.

The SEEK program at each senior college is administered independently of the others; there is some variation in the way each program operates. This paper was originally intended to assess the impact of the SEEK program at City College. Adequate data have become available, however, to allow evaluation of the programs at Hunter, Brooklyn, and Queens Colleges to be conducted, as well. These four colleges are the oldest institutions in the CUNY system, with both the largest student bodies and the largest SEEK programs.

Of the four colleges, the oldest SEEK program is at City College. Special emphasis was placed on encouraging SEEK students to participate in the larger college community.[2] At Hunter College, the program stressed remedial English and Mathematics. Brooklyn College's SEEK program emphasized its tutoring program and conducted a special project to teach standard English as a dialect to speakers of nonstandard dialects of English. At Queens College, the SEEK program was separated, to a great extent, from the rest of the college. Contrary to Board of Higher Education Guidelines[3] the program at Queens College offered, in addition to remedial courses, some credit bearing courses in the disciplines.

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[2] Information for this section was obtained from several reports including: The General Plan for the SEEK Program, 1971-1972; The General Plan for the SEEK Program, 1972-1973; and The Annual Report on the SEEK Program, 1971-1972.

Subjects

This study includes all SEEK students and SEEK eligibles who enrolled as freshmen in the above four colleges in Fall, 1971.[4]

Measures Utilized

Students who enrolled as freshmen in Fall, 1971 were followed through five years--until the time of data collection in June, 1976.

1) Number of Semesters Enrolled

   A stepwise multiple regression analysis was performed with number of semesters enrolled as the dependent variable, and the following independent (control) variables entered in the descending order of their contribution to the variance: college admissions average,[5] high school quality index,[6] and sex. The independent variable of major interest, SEEK participation/eligible nonparticipation was entered into the regression last in order to assess it's unique contribution to the variance.

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[3] The Board of Higher Education is the governing body of the City University of New York.

[4] In 1970, the first year of open admissions, there was a relatively small number of SEEK eligibles, who, after being rejected from SEEK by randomized procedures, enrolled in the senior colleges anyway; the number was too small for meaningful analysis when additional variables were introduced simultaneously. Entrants of 1972 and later had less than eight semesters in college by June, 1975, the time of data gathering.

[5] College admissions average (CAA) is the mean grade of high school academic courses.

[6] High School quality index (HSQI) is the mean score on the Stanford High School Reading Test obtained by all students from each high school who applied to CUNY in Fall, 1971. Although intended for all freshmen, the test was taken by only 50% of the 1971 entering class because of difficulty with its administration. With regard to its validity and reliability for use as a control

2) Graduation

A stepwise multiple regression analysis was performed with bachelor's degree receipt/nonreceipt as the dependent variable and the following independent (control) variables entered in the descending order of their contribution to the variance: CAA; HSQI; and sex. The dependent variable of major interest, SEEK participation/eligible nonparticipation was entered last in order to assess its unique contribution to the variance.

Research Findings

1) Number of Semesters Enrolled

a) For the four colleges combined, SEEK participation made a small but statistically significant contribution to the variance of the dependent variable, number of semesters enrolled (F-ratio of the increment in R^2 is significant at the .01 level of probability).

b) Considering each college separately, the contribution of SEEK participation was small but statistically significant at City and Queens Colleges, but not at Hunter and Brooklyn Colleges.

2) Graduation

For the four colleges combined, and at each of the four colleges individually, the proportion of variance contributed by SEEK participation to the dependent variable, graduation, was nonsignificant.

Summary

After five years, SEEK students are slightly more likely to have a larger number of semesters enrolled than SEEK eligibles. This small difference in retention does not appear to contribute to higher graduation rates. Additional

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variable, three tests were performed: a one way analysis of variance which demonstrated that the variance of the scores within high schools was significantly smaller than the variance of the scores between high schools (F was significant at the .01 level of probability); because the test was administered to freshmen both in 1970 and 1971, Pearson product moment (r=.95) and rank order correlations (rho=.96) were performed between the mean scores obtained by each high school for the two years. These extremely high correlations indicated the high reliability of the score.

data, not reported here, indicate that the greatest differences between the proportion of retained SEEK and SEEK eligible students occur in the early semesters. Differences between the two groups diminish with each succeeding year of attendance. This decreasing difference in retention rates ultimately results in equivalent graduation rates.

This study is incomplete. More effective comparison demands the demonstration of similarity of groups, data for which is lacking. It has been suggested that the eligibles who, after rejection for admission to the SEEK program, enroll in the senior colleges anyway, possess attributes (e.g., motivation) making them significantly dissimilar to the SEEK students. Further, more effective comparison demands the demonstration of the dissimilarity of treatment of the groups, data for which is lacking. It has been suggested that the eligibles may have received remediation, counseling, tutoring, and stipends; even if less than the SEEK students, perhaps the amount was equal to what was necessary.

Because of the incomplete nature of the study, this paper should be viewed as a progress report in a continuing program-evaluation research.

STEPWISE REGRESSION RESULTS FOR THE DEPENDENT VARIABLE, BACHELOR'S DEGREE RECEIPT/NONRECEIPT: AT FOUR COLLEGES COMBINED

STUDENTS ELIGIBLE FOR THE SEEK PROGRAM (N=1635)

Independent Variable	Standardized Regression Coefficient	F	Increment in R^2	F	Cumulative R^2	F
Control Variables:						
High School Grade Average	.22382	83.99**	.05644	97.67**	.05644	97.67**
Sex	.13589	32.24**	.01678	29.55**	.07322	64.47**
Mean Standardized Reading Score	.08769	13.55**	.00798	14.16**	.08120	48.05**
Research Variable:						
SEEK/Eligible not in SEEK	.04293	3.13	.00176	3.13	.08296	36.86**

*$p \leq .05$

**$p < .01$

STEPWISE REGRESSION RESULTS FOR THE DEPENDENT VARIABLE, BACHELOR'S DEGREE RECEIPT/NONRECEIPT:

at CITY COLLEGE

STUDENTS ELIGIBLE FOR THE SEEK PROGRAM (N=565)

Independent Variable	Standardized Regression Coefficient	F-Test	Increment in R^2	F-Test	Cumulative R^2	F-Test
Control Variables:						
High School Grade Average	.23631	32.41**	.05431	32.33**	.05431	32.33**
Sex	.15693	15.20**	.02717	16.62**	.08148	24.93**
Mean Standardized Reading Score	.12949	10.10**	.01672	10.40**	.09820	20.36**
Research Variable:						
SEEK/Eligible not in SEEK[1]	.06982	2.94	.00472	2.95	.10291	16.06**

at HUNTER COLLEGE

STUDENTS ELIGIBLE FOR THE SEEK PROGRAM (N=349)

Independent Variable	Standardized Regression Coefficient	F-Test	Increment in R^2	F-Test	Cumulative R^2	F-Test
Control Variables:						
High School Grade Average	.27535	26.26**	.09237	35.31**	.09237	35.31**
Mean Standardized Reading Score	.11746	5.23*	.01260	4.87*	.10497	20.29**
Sex	.09537	3.26	.00814	3.17	.11311	14.67**
Research Variable:						
SEEK/Eligible,not in SEEK	.01746	0.11	.00027	0.10	.11338	11.00**

*$p<.05$
**$p<.01$

STEPWISE REGRESSION RESULTS FOR THE DEPENDENT VARIABLE, BACHELOR'S DEGREE RECEIPT/NONRECEIPT:

at BROOKLYN COLLEGE

STUDENTS ELIGIBLE FOR THE SEEK PROGRAM (N=367)

Independent Variable	Standardized Regression Coefficient	F-Test	Increment in R^2	F-Test	Cumulative R^2	F-Test
Control Variables:						
High School Grade Average	.18504	12.62**	.04357	16.63**	.04357	16.63**
Sex	.13652	6.94**	.01708	6.62*	.06065	11.75**
Mean Standardized Reading Score	.04472	0.76	.00201	0.78	.06266	8.09**
Research Variable:						
SEEK/Eligible not in SEEK[1]	.00565	0.01	.00003	0.01	.06269	6.05**

at QUEENS COLLEGE

STUDENTS ELIGIBLE FOR THE SEEK PROGRAM (N=354)

Independent Variable	Standardized Regression Coefficient	F-Test	Increment in R^2	F-Test	Cumulative R^2	F-Test
Control Variables:						
High School Grade Average	.18898	12.95**	.04548	16.77**	.04548	16.77**
Sex	.14931	8.09**	.02142	8.06**	.06690	12.58**
Mean Standardized Reading Score	.03007	0.34	.00071	0.27	.06761	8.46**
Research Variable:						
SEEK/Eligible not in SEEK	.03563	0.47	.00126	0.47	.06886	6.45**

*$p < .05$
**$p < .01$

STEPWISE REGRESSION RESULTS FOR THE DEPENDENT VARIABLE, SEMESTERS ENROLLED; at FOUR COLLEGES COMBINED

STUDENTS ELIGIBLE FOR THE SEEK PROGRAM ($N=1635$)

Independent Variable	Standardized Regression Coefficient	F-Test	Increment in R^2	F-Test	Cumulative R^2	F-Test
Control Variables:						
High School Grade Average	.14053	32.27**	.01871	31.12**	.01871	31.12**
Sex	.12582	26.93**	.01301	21.93**	.03172	26.73**
Mean Standardized Reading Score	.10040	17.31**	.01121	19.10**	.04294	24.39**
Research Variable:						
SEEK/Eligible not in SEEK	.12955	27.76**	.01602	27.75**	.05896	25.53**

*$p<.05$

**$p<.01$

STEPWISE REGRESSION RESULTS FOR THE DEPENDENT VARIABLE, SEMESTERS ENROLLED:

at CITY COLLEGE

STUDENTS ELIGIBLE FOR THE SEEK PROGRAM (N=565)

Independent Variable	Standardized Regression Coefficient	F-Test	Increment in R^2	F-Test	Cumulative R^2	F-Test
Control Variables:						
Sex	.16315	15.81**	.02660	15.39**	.02660	15.39**
High School Grade Average	.11097	6.88**	.00823	4.79*	.03482	10.14**
Mean Standardized Reading Score	.05512	1.76	.00351	2.05	.03834	7.46**
Research Variable:						
SEEK/Eligible not in SEEK	.17464	17.73**	.02951	17.73**	.06785	10.19**

at HUNTER COLLEGE

STUDENTS ELIGIBLE FOR THE SEEK PROGRAM (N=349)

Independent Variable	Standardized Regression Coefficient	F-Test	Increment in R^2	F-Test	Cumulative R^2	F-Test
Control Variables:						
High School Grade Average	.17070	9.54**	.03696	13.32**	.03696	13.32**
Sex	.13361	6.05*	.01326	4.83*	.05022	9.15**
Mean Standardized Reading Score	.09260	3.07	.00881	3.23	.05903	7.21**
Research Variable:						
SEEK/Eligible not in SEEK	.05727	1.07	.00291	1.07	.06194	5.68*

$^*p < .05$
$^{**}p < .01$

STEPWISE REGRESSION RESULTS FOR THE DEPENDENT VARIABLE, SEMESTERS ENROLLED:

at BROOKLYN COLLEGE

STUDENTS ELIGIBLE FOR THE SEEK PROGRAM (N=367)

Independent Variable	Standardized Regression Coefficient	F-Test	Increment in R^2	F-Test	Cumulative R^2	F-Test
Control Variables:						
High School Grade Average	.16969	10.84**	.03482	13.17**	.03482	13.17**
Mean Standardized Reading Score	.17095	11.29**	.02820	10.96**	.06302	12.24**
Sex	.10079	3.86*	.01069	6.31*	.07370	9.67**
Research Variable:						
SEEK/Eligible not in SEEK[1]	.09369	3.39	.00860	3.39	.08230	8.12**

at QUEENS COLLEGE

STUDENTS ELIGIBLE FOR THE SEEK PROGRAM (N=354)

Independent Variable	Standardized Regression Coefficient	F-Test	Increment in R^2	F-Test	Cumulative R^2	F-Test
Control Variables:						
High School Grade Average	.13846	6.87**	.02046	6.96**	.02046	6.96**
Mean Standardized Reading Score	.11914	5.21*	.01100	3.77	.03146	5.70**
Sex	.07241	1.88	.00460	1.58	.03606	4.36**
Research Variable:						
SEEK/Eligible not in SEEK	.14986	8.23**	.02221	7.78**	.05827	5.40**

*$p<.05$
**$p\leq.01$

SENIORS EVALUATE GOALS, FUNCTIONS AND FACULTY

Paul Succop
SUNY at Buffalo

Recent concern for the protection of the consumer of postsecondary education has translated into a number of federal government strategies and guidelines (1,2,3). The intentions of these strategies are: (1) to protect "student rights" and (2) to prevent postsecondary institutions from misrepresenting course offerings and other benefits promised in the institutional literature. The phrase "in the institutional literature" is all-important for both legal and practical purposes, as an institution of higher learning or any members of its staff can be held accountable for only that which is stated in the institutional literature and not the beliefs or attitudes about the institution propagated by those external to the process of policy-making.

Economic inflation and recession, the devaluation of postsecondary degrees, and the decreasing demand for college graduates add a few confounding dimensions to federal protection of student rights. To survive, a college or university must attract students. To attract students and to remain competitive with other educational institutions, the institution must have something to offer in the educational marketplace. Postsecondary educational policy-makers must be cautious in their promises to the students, for legal and economic reasons.

Given these political and economic realities, policy-makers have essentially three alternative decisions: (1) do nothing, and run the risk of retrenchment or curtailment; (2) attempt to be competitive by making false or unsubstantiated promises; or (3) attempt to improve their situation in the educational marketplace through active and honest recruitment of students. In order to honestly recruit students, administrators need to know potential students' expectations and present students' perceptions of their college and college experience. Institutional research is required.

This paper reports a methodology for and the results of research into college students' experiences, which has been undertaken by the Student Testing and Research Office, SUNY/B. The methodology can be viewed as a model for future research into student needs. The results should be exported with caution, as the students' responses may reflect attitudes and opinions peculiar to students at SUNY/B.

Methodology

Sample. Seven-hundred and sixteen students were randomly selected from the population of 2072 SUNY/B students who indicated on their January registration materials (1-15-74) that they expected to receive a baccalaureate in May, 1974.[1] Questionnaires were mailed to these seniors in mid-April, 1974.

Two hundred and sixty-eight students returned usable questionnaires. Complete data, however, was obtained on slightly fewer than this number. The data analysis used a subset of this sample, as specified below.

Questionnaire. Of the eleven-page, 345-item 1974 SENIOR SURVEY, one-hundred and forty-six items in three areas were selected for analysis for this report. These areas are: (1) Personal goals--past and present; (2) Evaluations of major and non-major faculty; and (3) Functions of the University--their actual importance and the importance they should have. Similar research and questionnaire designs have been previously undertaken and noted in the research literature (4,5,6,7,8).

The students were asked to indicate: the importance to them of ten goal statements, both during college and at the "present time," the degree to which their initial goals had been fulfilled during their college experience; and the degree of benefit they derived from courses at SUNY/B towards goal fulfillment. Importance items were responded to on a five option scale ranging from "extremely high" to "of no importance." The fulfillment scale ranged from "totally" fulfilled to "not at all" fulfilled. For the "benefit of courses" items, the scale ranged from "of the utmost benefit" to "of no benefit."

Twenty statements about major and non-major faculty were included. The students were asked to respond for both sets of faculty on a five option scale ranging from "true for all faculty" to "true for no faculty."

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[1] Random selection was produced by the generation of Pseudo-random binary integers by a congruence method. Univac Math-Pack Program Abstracts, UP-4051 Rev. 2., Page 14.1.

For the importance functions at SUNY/B should and actually have, a scale ranging between "of extremely high importance" and "of no importance" was used to rate twenty-three possible functions of this university.

Data Analysis. Two-way multivariate and univariate analyses of variance were performed on each cluster of SENIOR SURVEY items. The independent variables assessed were: the respondents initial and present Faculty membership,[1] and their Sex. Clusters of dependent variables were analyzed together in the multivariate technique to produce a single F-statistic for making decisions regarding group differences on the independent variables. The eight sets of items analyzed were the four sets of ten personal goal items, two sets of twenty statements about faculty, and two sets of twenty-three statements of importance of SUNY/B functions.

Initial and present Faculty were crossed with the sex variable in separate analyses, thus resulting in an 8 x 2 statistical design. The program MULTIVARIANCE (9) was utilized for all statistical computations.

As the multivariate tests required complete data cases, *Ss* with missing data were excluded from the statistical analysis, by questionnaire area. Two-hundred and thirty-two seniors had complete data for the goals items, two-hundred and thirty-one students for the faculty statements, and two-hundred and thirty-five for the importance of SUNY/B function statements.

Research Design. The independent variables of Initial and Present Faculty were of interest to this researcher due to the status of the Faculty as an administrative and policy-making unit. Are students within the same Faculty a more homogeneous group than seniors in general, after controlling for sex differences? The answer to this question provides the answer to others, namely on what level must any administrative or policy changes be made? Should students prove not to differ by Faculty, centralized Administration should take leadership in making any changes indicated by the students' responses. If differences are noted, individual Faculty units must initiate policies appropriate for their students.

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[1] The eight Faculty groups analyzed are the seven undergraduate academic divisions at SUNY/B and an eighth group consisting of students with a "Double" or "Special" major.

TABLE 1

MULTIVARIATE F-RATIOS FOR THE TESTS OF SIGNIFICANT EFFECTS OF THE INDEPENDENT VARIABLES ON THE SETS OF DEPENDENT VARIABLES

Sets of goal items:	Present Faculty[1]	Initial Faculty	Sex	Present Faculty * Sex	Initial Faculty * Sex
Importance of goals during college	1.89$^{\alpha}$	1.56$^{\alpha}$	1.95$^{\beta}$(pf)	NS	NS
Degree of fulfillment of goals during college	2.06$^{\alpha}$	1.55$^{\alpha}$	NS	NS	1.41$^{\alpha}$
Contribution of courses to fulfillment of goals	1.82$^{\alpha}$	1.64$^{\alpha}$	NS	NS	NS
Importance of goals now	1.36$^{\alpha}$	NS	NS	NS	NS

Sets of faculty items:	Present Faculty	Initial Faculty	Sex	Present Faculty * Sex	Initial Faculty * Sex
For: Major faculty	1.94$^{\gamma}$	NS	NS	NS	NS
For: Non-Major faculty	NS	NS	1.86$^{\delta}$(pf) 1.94$^{\delta}$(if)	NS	NS

Sets of importance function statements:	Present Faculty	Initial Faculty	Sex	Present Faculty * Sex	Initial Faculty * Sex
Importance function should have	1.27$^{\varepsilon}$	NS	NS	NS	NS
Importance function actually has	1.52$^{\varepsilon}$	1.35$^{\varepsilon}$	NS	NS	NS

$^{\alpha}$ $p < .05$, df=70 and 1213.824

$^{\beta}$ $p < .05$, df=10 and 207

$^{\gamma}$ $p < .05$, df=140 and 1312.833

$^{\delta}$ $p < .05$, df=20 and 196

$^{\varepsilon}$ $p < .05$, df=160 and 1336.187

NS - not significant ($p > .05$)

(pf) - significant after controlling for the students' present Faculty

(if) - significant after controlling for the students' initial Faculty

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[1] Faculty refers to the seven undergraduate academic divisions at SUNY/B and an eighth group consisting of students with a "Double" or "Special" major.

The sex variable served as a control for differential enrollments of males and females in different Faculties and helped to answer the question: With all this talk about Women's Lib, should males and females be treated differently by administrative policy? If no differences are noted between males and females in terms of goals, reactions to faculty and importance of University functions, this time-treasured variable can essentially be ignored in making such policies. If differences exist, sex of the student should be taken into account in policy-making.

Results and Discussion

The sixteen two-way MANOVAs resulted in fifteen significant ($p < .05$) multivariate F-ratios. The F-values and degrees of freedom for the tests of significance are presented in Table 1.

Responses by the seniors in different Faculty groups differed significantly on each of the clusters of items except statements about non-major faculty. For the students' initial Faculty groups, four significant differences were noted. These occurred for: "Importance of goals during college"; "Degree of fulfillment of goals"; "Contribution of courses to fulfillment of goals"; and "Importance SUNY/B functions actually have."

Only three significant multivariate F-ratios were noted for differences between the sex groups: males and females differed significantly on the importance of their goals during college when sex was crossed with the seniors' present Faculty (but not when this variable was crossed with the Ss' initial Faculty), and the two sex groups differed significantly in regard to statements about non-major faculty members after controlling for either the students' initial or present Faculty affiliation.

One significant multivariate F-ratio for an interaction between a Faculty variable and the sex variable also was noted. This occurred for the set of "degree of fulfillment of goals during college" items.

The students' present Faculty is clearly the most important variable surveyed here. The nature of these significant differences can be ascertained by examining the group means, by contrasting each individual Faculty group with the sample mean[1] for the items where significant multivariate F-ratios were noted, and by noting which goal items, major and non-major faculty or importance of functions statements, received significantly different responses by the groups of seniors. These detailed analyses are too lengthy to go into here, but a summarization of them follows.[1]

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[1] Deviation or D-type contrasts were used for this purpose.

The differences are largely stereotypical. For students with majors in *Arts and Letters*, "increased openness/skill in interpersonal relationships" had been a more important goal, and "career preparation" a less important goal than for seniors in general. Engineers attributed less importance to four of these goal items saying in essense: intellectual and vocational goals are more important to them than interpersonal and personal goals. Students in *Health Sciences* claimed "career preparation" to be highest on their list of goals, well above the marginal mean, as was "increased openness/skill in interpersonal relationships." Students in *Social Sciences* attributed less importance to "career preparation" and "development of critical thinking and problem solving skills" than did seniors in general. Seniors studying *Management* rated "career preparation" as their most important goal, significantly more important to them than to seniors in general, but "increased knowledge of humanities, social science, and natural science" as their second least important goal, well below the marginal mean. Perhaps the most interesting responses were by students in *Natural Sciences* who rated the importance of all items similarly to the group in general, and responses by students with *double or special majors* who emphasized the importance of "development of critical thinking and problem solving skills" and "increased knowledge of humanities, social science, and natural science" to a greater degree than the average senior.

Similar differences pervade the other two questionnaire areas. Students in *Arts and Letters* said fewer of their major faculty give them "out-of-class assignments that are reasonable in length" than students overall. Students in *Engineering* indicated that a larger proportion of their major faculty treated them impersonally, avoided contact with them outside the classroom, and gave assignments that were irrelevant to the course than did seniors in general. Students in *Health Sciences* indicated a larger proportion of their faculty expressed "concern and dedication to their professional area" and

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[1] A more detailed analysis may be obtained through inquiry to the author.

"related material to contemporary life" than did seniors in other Faculties. Students in Educational Studies believed the University stresses the "promotion of knowledge and interest in world-wide issues" to a lesser extent than students in general. Social Science students believed the University to be "promoting excellence in teaching" to a lesser extent that did students in general. And so on.

The whole point to the numerous ways students in the various Faculties differ is that a substantial amount of the recruitment of students, policy changes to accommodate students, and further institutional research, must be undertaken on the administrative level of individual Faculties rather than at the centralized level. Given this kind of research, both Faculty and students are better able to assess the programs which they provide or consume. Discrepancies between Faculty and student opinion of importance of goals and functions can indicate a number of things. Students of a particular major may feel a particular goal or importance function is less or more important than do Faculty members. This may result from a general and honest misunderstanding by students or misdirected aspirations on their parts or failure of the Faculty to define and implement the goals and functions they believe are important. On the other hand, recognizing the importance of various goals and functions to students within their Faculty, they may want to modify their programs to support fulfillment of these goals.

Other analyses of this data showed that nearly half (46 percent) of this sample changed majors during their tenure at SUNY/B (10). Although this is not necessarily undesirable or problematic for administrators, it may be a problem for students. As the statistical analyses "controlled" for differences attributable to sex, it is not at all impossible that students originally chose majors which stereotypically attract greater proportions of a certain sex group, then during their college career, changed to a different major which more completely fit their stereotyped views of themselves. If the ramifications of this large proportion of students changing majors are problematic, certain administrative policy changes may be warranted.

Administrators at the centralized level cannot be left out of this, however. If the results of institutional research reveal a rather negative overall response to a goal, faculty statement, or importance of function statement which administrators feel necessary and important, examination of policy and its implications on the University level is warranted. Again, human judgment and, perhaps, further research will be needed to pinpoint the sources of this problem. Differences in the endorsement of items by sex is one example of a problem that must be handled at this level. One of the significant multivariate F-ratios noted in this report (after controlling for the students' present Faculty), occurred because males were more positive about non-major faculty members than females. Specifically, a greater proportion of men than women felt non-major faculty gave fairer grades. Females more frequently than males indicated that they were given less "opportunity to participate in discussions, ask questions, and express points of view." If such a blatant expression of sex bias does, indeed, exist, it must be remedied immediately. It's the law.

Similarly, those colleges and universities that can most accurately describe their functions and goals and demonstrate fulfillment of them are most apt to attract and maintain a viable student body. It is also a law: of economics; of survival.

REFERENCES

1. Towards a Federal Strategy for Protection of the Consumer of Education. Washington, D.C.: Report of the Subcommittee on Educational Consumer Protection, U.S. Department of Health, Education, and Welfare, July, 1975.

2. Proposed Consumer Representation Plans. Washington, D.C.: Federal Register, Vol. 40, No. 229 - Wednesday, Nov. 26, 1973, pp. 55137-55160.

3. Consumer Protection in Postsecondary Education. Knoxville, Tennessee: Report to the Second National Conference, Education Commission of the States, Nov. 14-15, 1974.

4. Morey, A. I. and Teilmann, K. USC Goals: Viewpoints of Faculty, Students and Administrators. Office of Institutional Studies, University of Southern California, June, 1973.

5. Perceptions of Existing and Desired University Goals, The Results of the Institutional Goals Inventory Survey of Faculty, Students, Administrators, and Alumni. University of Houston: The Academic Planning Staff, Office of The Executive Vice President and Dean of Faculties, September, 1974.

6. Harshman, C. L. Linking Data to Decisions: Operationalizing Concepts in Institutional Goal Development. A paper presented to the Annual Forum of Association for Institutional Research. Saint Louis University: Metropolitan College, May, 1975.

7. Peterson, R. E. The Crisis of Purpose: Definition and Uses of Institutional Goals. Institutional Research Program for Higher Education. Princeton, New Jersey: Educational Testing Service, Report No. 5, October, 1970.

8. Peterson, R. E. College Goals and the Challenge of Effectiveness. Institutional Research Program for Higher Education. Princeton, New Jersey: Educational Testing Service, 1971.

9. Finn, J. D. Multivariance. Univariate and Multivariate Analysis of Variance, Covariance, and Regression. A Fortran IV Program. Version 5.2. Chicago: National Educational Researchers, Inc., June, 1974.

10. Coles III, H. W. 1974 Senior Survey. State University of New York at Buffalo: Student Testing and Research, May, 1975.

A GOAL PROGRAMMING MODEL FOR FACULTY TEACHING LOAD EQUALIZATION

Robert Lewis
University of Massachusetts - Amherst

I. Introduction - Statement of the Problem

In a university where program enrollments are changing and restrictive faculty recruitment policies are in effect, wide variations in faculty teaching loads develop over time. For example, Table 1 depicts faculty teaching loads at UMass/Amherst for fiscal year 1976. Teaching loads (student credit hours per full-time equivalent faculty) range from a low of 340.9 to a high of 1028.3 for undergraduate level teaching and from a low of 143.1 to a high of 317.2 for graduate level teaching.

Academic managers can respond to this situation in several ways. One response might be to encourage the sharing of faculty between schools and colleges in order to teach courses that are similar in content. Table 1 provides some evidence that this practice already exists. For example, teaching loads in the Interdisciplinary Programs were not calculated because of the understatement of the number of faculty in those programs due to the sharing of faculty from Humanities and Fine Arts. While other examples of the sharing of faculty might not be as substantial as this one, it is not difficult to imagine instances of faculty teaching outside their discipline.

Before implementing such a policy, which might meet with opposition from those faculty who are discipline oriented, it would be useful to have some measure of the equalization in teaching loads that would result. If the possible improvement were rather minimal, a decision might be made to investigate some other course of action.

One model that provides a framework within which one can investigate the policy of sharing faculty is a goal programming model. However, before presenting a model for faculty teaching load equalization, it will be useful to first describe the general characteristics of goal programming.

TABLE 1 - FACULTY TEACHING LOADS AT UMASS/AMHERST FOR FISCAL YEAR 1976

SCHOOL/COLLEGE	F.T.E FACULTY	INSTRUCTIONAL LOAD UNDERGRADUATE (S.C.H.)	INSTRUCTIONAL LOAD GRADUATE (S.C.H.)	TEACHING LOAD UNDERGRADUATE (S.C.H./F.T.E.)	TEACHING LOAD GRADUATE (S.C.H./F.T.E)
Humanities & Fine Arts	363.3	120,995	9,286	402.9	147.3
Social & Behavioral Sci.	176.9	91,426	9,489	728.9	184.4
Natural Sci. & Math.	264.3	117,489	11,403	620.1	152.4
Food & Natural Resources	118.7	68,245	6,292	789.6	195.0
Engineering	90.0	19,638	4,634	340.9	143.1
Business	68.5	42,352	8,664	1,028.3	317.2
Physical Education	33.2	20,513	980	708.6	230.6
Health Science	50.2	17,952	3,466	578.1	181.0
Education	84.2	27,629	16,331	990.5	290.0
Interdisciplinary	13.0	55,078	660	1	1
Amherst Campus	1,262.3	581,317	71,205	632.2	216.1

1 Understatement of faculty in Interdisciplinary Programs due to sharing of faculty from other schools and colleges pecludes accurate calculation of teaching loads

II. General Goal Programming Model

Goal programming is a variation of linear programming. As such it is a technique for minimizing (or maximizing) a linear objective function subject to a set of linear constraints. The important difference between goal programming and linear programming is that in goal programming the objective function contains the surplus variable (amount of goal exceeded) and the slack variable (amount of goal unattained) for each goal, whereas in linear programming the objective function contains the decision variables.

Figure 1 depicts a mathematical description of the general goal programming model. Equation (0) defines the objective function. As indicated, it is possible to weight the slack and surplus variables for each goal, which allows investigation of priorities for competing goals.

Equation (1) defines the constraint set which consists of one equation for each goal. The technological coefficient in each equation defines the contribution of each decision variable to the attainment of that goal. The slack and surplus variables also appear in each goal equation.

Equation (2) states that all decision variables will take on nonnegative values.

III. Faculty Teaching Load Equalization Model

Figure 2 depicts a mathematical description of the faculty teaching load equalization model. Equation (0) defines the objective function. As before, it contains the slack and the surplus variables; however, they are unweighted. It is assumed that both undergraduate and graduate instruction are of equal importance.

Equation (1) defines the goal of satisfying the demand for instruction at the undergraduate level. There is one equation for each department. The assumption is made that all faculty who teach in a department at the undergraduate level carry the same average teaching load for that department regardless of where they originate.

Equation (2) defines the goal of satisfying the demand for instruction at the graduate level. As for the undergraduate level, there is one equation for each department, and the same assumption regarding the graduate teaching load holds.

FIGURE 1 - GENERAL GOAL PROGRAMMING MODEL

MINIMIZE:
$$\sum_{i=1}^{M} W_i S_i^+ + W_i S_i^- \qquad (0)$$

SUBJECT TO:
$$\sum_{j=1}^{N} A_{i,j} X_j - S_i^+ + S_i^- = G_i \qquad i = 1, 2, \ldots M \qquad (1)$$

$$X_j \geq 0 \qquad j = 1, 2, \ldots N \qquad (2)$$

WHERE:

X_j = the jth decision variable

$A_{i,j}$ = the technological coefficient for the jth decision variable in the ith goal

G_i = the ith goal

S_i^+ = the surplus variable for the ith goal

S_i^- = the slack variable for the ith goal

W_i = the relative weight of the ith goal

M = the number of goals

N = the number of decision variables

FIGURE 2 - FACULTY TEACHING LOAD EQUILIZATION MODEL

MINIMIZE:

$$\sum_{j=1}^{N} U^{S^{+}}_{i,j} + U^{S^{-}}_{i,j} + G^{S^{+}}_{i,j} + G^{S^{-}}_{i,j} \qquad (0)$$

SUBJECT TO:

$$U^{L}_{j} \sum_{i=1}^{N} U^{T}_{i,j}\, U^{X}_{i,j} - U^{S^{+}}_{j} + U^{S^{-}}_{j} = U^{I}_{j} \qquad \text{for } j = 1,2,\ldots N \qquad (1)$$

$$G^{L}_{j} \sum_{i=1}^{N} G^{T}_{i,j}\, G^{X}_{i,j} - G^{S^{+}}_{j} + G^{S^{-}}_{j} = G^{I}_{j} \qquad \text{for } j = 1,2,\ldots N \qquad (2)$$

$$\sum_{j=1}^{N} U^{T}_{i,j}\, U^{X}_{i,j} + \sum_{j=1}^{N} G^{T}_{i,j}\, G^{X}_{i,j} = F_{i} \qquad \text{for } i = 1,2,\ldots N \qquad (3)$$

$$U^{T}_{i,j}\, U^{X}_{i,j} \leq U^{T}_{i,j}\, F_{i} \qquad \text{for } i,j = 1,2,\ldots N \qquad (4)$$

$$G^{T}_{i,j}\, G^{X}_{i,j} \leq G^{T}_{i,j}\, F_{i} \qquad \text{for } i,j = 1,2,\ldots N \qquad (5)$$

$$U^{X}_{i,j} \geq 0 \quad G^{X}_{i,j} \geq 0 \qquad \text{for } i,j = 1,2,\ldots N \qquad (6)$$

WHERE:

$U^{T}_{i,j}\, U^{X}_{i,j}$ = number of full-time equivalent faculty from department i teaching at the undergraduate level in department j

$G^{T}_{i,j}\, G^{X}_{i,j}$ = number of full-time equivalent faculty from department i teaching at the graduate level in department j

$U^{T}_{i,j}$ = index of shared teaching at the undergraduate level for faculty from department i in department j

$G^{T}_{i,j}$ = index of shared teaching at the graduate level for faculty from department i in department j

F_i = number of full-time equivalent faculty for department i

U^I_j = instructional load (student credit hours) at the undergraduate level for department j

G^I_j = instructional load at the graduate level for department j

U^L_i = average teaching load (student credit hours per full-time equivalent faculty) at the undergraduate level for department j

G^L_i = average teaching load at the graduate level for department j

$U^{S^-}_j$ = slack variable at the undergraduate level for department j

$U^{S^+}_j$ = surplus variable at the undergraduate level for department j

$G^{S^-}_j$ = slack variable at the graduate level for department j

$G^{S^+}_j$ = surplus variable at the graduate level for department j

N = number of departments

Equation (3) requires that all available faculty teach somewhere in the system. This may create a surplus (too much instructional capacity) in a department, which would decrease the average teaching load for those faculty teaching in that department. Likewise, it may create a slack (too little instructional capacity) in a department, which would increase the average for those faculty teaching in that department.

Equation (4) sets an upper bound on the number of faculty from department i that can teach in department j at the undergraduate level. Likewise, Equation (5) sets an upper bound at the graduate level.

Equation (6) states that all decision variables take on nonnegative values.

IV. Implementation of the Model

The determination of an index of shared teaching, T, is crucial to this model. One way to generate it would be to base it on an Induced Course Matrix. (Briefly, an Induced Course Load Matrix measures the number of student credit hours, SCH, that a full-time equivalent student in department i takes in department j.) Since a student commonly takes the largest share of his instruction in his own department, the shared teaching index could be referenced against this value. For example, a full-time equivalent student in Department A takes 8 SCH in Department A, 3 SCH in Department B, 2 SCH in Department C, and 2 SCH in Department D. The shared teaching indices for Department A would be as follows:

$T_{AA} = 1.0$ $T_{AB} = 0.375$ $T_{AC} = 0.25$ $T_{AD} = 0.25$

The use of a shared teaching index, generated as described above, assumes that the academic backgrounds of the faculty in a department are reflected in the courses taken by the student majors of that department. In order to insure some minimal level of academic background, it may be necessary to set some lower limit on each $T_{i,j}$ (e.g. $T_{i,j} \geq 0.1$).

The average teaching loads, L, are also important to the model. They might be based on some improvement over previous average teaching loads (i.e. an increase in average teaching loads for those less than the campus average or a decrease in average teaching loads for those greater than the campus average). Alternately, each L_j could be set equal to the campus average. Either method would produce useful results.

Table 2 contains the teaching loads, T Load, and instructional loads, I Load; and Table 3, the teaching indices, T, for one run of the model. The instructional loads for each school/college are the same as in Table 1, while the teaching loads are the same as the campus average in Table 1. The teaching indices were generated as described above.

Table 4 contains the optimal solution of the model for the data just described. The system is almost in balance with two exceptions. There is a slack of 535 SCH at the graduate level in Business and a surplus of 536 SCH at the graduate level in Education. This represents an imbalance of 2.5 FTE faculty system wide. It is interesting that this solution is one of 56 alternate solutions each with the same imbalance (1071SCH).

V. Extension of the Model

The faculty teaching load model discussed so far only considers where faculty are able to teach, not where they would prefer to teach. Figure 3 depicts a mathematical model which extends the previous model to include this consideration.

Equation (3) defines the goal of satisfying faculty teaching preferences. It includes an index of desirability of teaching, D, which is analogous to the index of shared teaching, T. However, instead of measuring the extent to which teaching can be shared, it measures the desirability of sharing teaching.

Also included in Equation (3) is the faculty preference, P. Since the desirability index, D, has a maximum value of 1, the faculty preference in each department will be equal to the number of faculty in each department.

Relative weights for undergraduate and graduate instruction and faculty preference appear in the objective function, Equation (0). By assigning different values to these weights, it is possible to investigate various priorities for the three goals, Equations 1, 2, and 3.

All other equations are the same as in Figure 2.

VI. Implementation of the Extended Model

Table 5 contains the same test data as Table 2 with the addition of the weights for faculty preference and instructional loads, which were chosen to

TABLE 2 - FTE FACULTY, TEACHING LOADS, AND INSTRUCTIONAL LOADS (ORIGINAL MODEL)

DEPART	NAME	FTE FAC	T LOAD U	T LOAD G	I LOAD U	I LOAD G
9901	HUM/F ART	363.3	623.2	216.1	120995.	9286.
9902	SOC/BEH SC	176.9	623.2	216.1	91426.	9489.
9903	NAT SCI/MA	264.3	623.2	216.1	117489.	11403.
9904	ED/NAT RES	118.7	623.2	216.1	68245.	6292.
9905	ENGINEER	90.0	623.2	216.1	19638.	4634.
9906	BUSINESS	68.5	623.2	216.1	42352.	8664.
9907	PHYS EDUC	33.2	623.2	216.1	20513.	980.
9908	HEALTH SCI	50.2	623.2	216.1	17952.	3466.
9909	EDUCATION	84.2	623.2	216.1	2[illegible]629.	16331.
9910	INTERDISC	13.0	623.2	216.1	55078.	660.

TABLE 3 - INDICES OF SHARED TEACHING (ORIGINAL MODEL)

DEPART I	DEPART J	T(I,J) U	T(I,J) G	DEPART J	T(I,J) U	T(I,J) G
9901	9901	1.000	1.000	9902	.205	.028
9901	9903	.109	.008	9904	.060	.009
9901	9905	.002	.001	9906	.012	.002
9901	9907	.023	.001	9908	.003	0.000
9901	9909	.085	.036	9910	.127	.002
9902	9901	.429	.015	9902	1.000	1.000
9902	9903	.189	.027	9904	.082	.003
9902	9905	.003	0.000	9906	.042	.009
9902	9907	.030	.001	9908	.008	.002
9902	9909	.109	.032	9910	.148	.001
9903	9901	.281	.004	9902	.181	.007
9903	9903	1.000	1.000	9904	.045	.008
9903	9905	.009	.007	9906	.012	.006
9903	9907	.024	0.000	9908	.007	.003
9903	9909	.074	.004	9910	.113	.005
9904	9901	.134	.002	9902	.132	.051
9904	9903	.323	.154	9904	1.000	1.000
9904	9905	.007	.023	9906	.060	.020
9904	9907	.020	0.000	9908	.007	.024
9904	9909	.040	.029	9910	.072	.004
9905	9901	.178	.001	9902	.200	.005
9905	9903	.674	.069	9904	.018	.017
9905	9905	1.000	1.000	9906	.018	.020
9905	9907	.033	.001	9908	0.000	.007
9905	9909	.004	.001	9910	.156	.020
9906	9901	.218	.002	9902	.387	.036
9906	9903	.422	.003	9904	.078	.007
9906	9905	.005	.010	9906	1.000	1.000
9906	9907	.032	.005	9908	.001	.003
9906	9909	.015	.010	9910	.112	0.000
9907	9901	.205	.040	9902	.331	.046
9907	9903	.212	.104	9904	.050	.032
9907	9905	0.000	0.000	9906	.009	.041
9907	9907	1.000	1.000	9908	.024	.009
9907	9909	.203	.009	9910	.107	.012
9908	9901	.356	0.000	9902	.365	.084
9908	9903	.961	.050	9904	.060	.008
9908	9905	.003	.005	9906	.008	.016
9908	9907	.048	0.000	9908	1.000	1.000
9908	9909	.080	.053	9910	.191	0.000
9909	9901	.251	.008	9902	.370	.028
9909	9903	.133	.002	9904	.080	.001
9909	9905	0.000	0.000	9906	.004	.006
9909	9907	.031	0.000	9908	.006	.001
9909	9909	1.000	1.000	9910	.129	.001
9910	9901	1.000	.039	9902	1.000	.383
9910	9903	1.000	.182	9904	.238	.053
9910	9905	.035	.048	9906	.111	.011
9910	9907	.142	0.000	9908	.047	.015
9910	9909	.266	.055	9910	1.000	1.000

TABLE 4 - OPTIMAL SOLUTION (ORIGINAL MODEL)

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            DEPT J     NAME        DEPT I      NAME         FTE FAC    LEVEL

             9901     HUM/F ART     9901    HUM/F ART       151.8      UGRAD
             9901     HUM/F ART     9901    HUM/F ART        41.7      GRAD
             9901     HUM/F ART     9903    NAT SCI/MA       42.3      UGRAD
             9901     HUM/F ART     9903    NAT SCI/MA        1.1      GRAD
             9901     HUM/F ART     9904    FD/NAT RES         .2      GRAD
 T LOAD U    623.2    SURPLUS U          0.   SLACK U             0. I LOAD U     120995.
 T LOAD G    216.1    SURPLUS G          0.   SLACK G             0. I LOAD G       9286.
***************************************************************************************
             9902     SOC/BEH SC    9901    HUM/F ART        74.5      UGRAD
             9902     SOC/BEH SC    9902    SOC/BEH SC       67.4      UGRAD
             9902     SOC/BEH SC    9902    SOC/BEH SC       39.7      GRAD
             9902     SOC/BEH SC    9905    ENGINEER          4.9      UGRAD
             9902     SOC/BEH SC    9908    HEALTH SCI        4.2      GRAD
 T LOAD U    623.2    SURPLUS U          0.   SLACK U             0. I LOAD U      91426.
 T LOAD G    216.1    SURPLUS G          0.   SLACK G             0. I LOAD G       9489.
***************************************************************************************
             9903     NAT SCI/MA    9903    NAT SCI/MA      169.3      UGRAD
             9903     NAT SCI/MA    9903    NAT SCI/MA       31.3      GRAD
             9903     NAT SCI/MA    9904    FD/NAT RES       18.3      GRAD
             9903     NAT SCI/MA    9905    ENGINEER         19.3      UGRAD
             9903     NAT SCI/MA    9907    PHYS EDUC         3.0      GRAD
             9903     NAT SCI/MA    9909    EDUCATION          .2      GRAD
 T LOAD U    623.2    SURPLUS U          0.   SLACK U             0. I LOAD U     117489.
 T LOAD G    216.1    SURPLUS G          0.   SLACK G             0. I LOAD G      11403.
***************************************************************************************
             9904     FD/NAT RES    9901    HUM/F ART        21.8      UGRAD
             9904     FD/NAT RES    9902    SOC/BEH SC       14.5      UGRAD
             9904     FD/NAT RES    9902    SOC/BEH SC         .5      GRAD
             9904     FD/NAT RES    9903    NAT SCI/MA       11.9      UGRAD
             9904     FD/NAT RES    9904    FD/NAT RES       48.5      UGRAD
             9904     FD/NAT RES    9904    FD/NAT RES       26.8      GRAD
             9904     FD/NAT RES    9907    PHYS EDUC         1.1      GRAD
             9904     FD/NAT RES    9908    HEALTH SCI        3.0      UGRAD
             9904     FD/NAT RES    9909    EDUCATION         6.7      UGRAD
             9904     FD/NAT RES    9909    EDUCATION          .1      GRAD
             9904     FD/NAT RES    9910    INTERDISC         7.1      UGRAD
             9904     FD/NAT RES    9910    INTERDISC          .7      GRAD
 T LOAD U    623.2    SURPLUS U          0.   SLACK U             0. I LOAD U      68245.
 T LOAD G    216.1    SURPLUS G          0.   SLACK G             0. I LOAD G       6292.
***************************************************************************************
             9905     ENGINEER      9901    HUM/F ART          .7      UGRAD
             9905     ENGINEER      9901    HUM/F ART          .4      GRAD
             9905     ENGINEER      9904    FD/NAT RES         .8      UGRAD
             9905     ENGINEER      9904    FD/NAT RES        2.7      GRAD
             9905     ENGINEER      9905    ENGINEER         30.0      UGRAD
             9905     ENGINEER      9905    ENGINEER         10.4      GRAD
 T LOAD U    623.2    SURPLUS U          0.   SLACK U             0. I LOAD U      19638.
 T LOAD G    216.1    SURPLUS G          0.   SLACK G             0. I LOAD G       4634.
***************************************************************************************
             9906     BUSINESS      9901    HUM/F ART         4.4      UGRAD
             9906     BUSINESS      9901    HUM/F ART          .7      GRAD
             9906     BUSINESS      9902    SOC/BEH SC        7.4      UGRAD
             9906     BUSINESS      9902    SOC/BEH SC        1.6      GRAD
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TABLE 4 - CONTINUED

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          DEPT J     NAME        DEPT I      NAME        FTE FAC     LEVEL

           9906    BUSINESS       9903    NAT SCI/MA       3.2       UGRAD
           9906    BUSINESS       9903    NAT SCI/MA       1.6       GRAD
           9906    BUSINESS       9904    FD/NAT RES       7.1       UGRAD
           9906    BUSINESS       9904    FD/NAT RES       2.4       GRAD
           9906    BUSINESS       9905    ENGINEER         1.6       UGRAD
           9906    BUSINESS       9905    ENGINEER         1.8       GRAD
           9906    BUSINESS       9906    BUSINESS        41.8       UGRAD
           9906    BUSINESS       9906    BUSINESS        26.7       GRAD
           9906    BUSINESS       9907    PHYS EDUC         .3       UGRAD
           9906    BUSINESS       9907    PHYS EDUC        1.4       GRAD
           9906    BUSINESS       9908    HEALTH SCI        .4       UGRAD
           9906    BUSINESS       9908    HEALTH SCI        .8       GRAD
           9906    BUSINESS       9909    EDUCATION         .3       UGRAD
           9906    BUSINESS       9909    EDUCATION         .5       GRAD
           9906    BUSINESS       9910    INTERDISC        1.4       UGRAD
           9906    BUSINESS       9910    INTERDISC         .1       GRAD

 T LOAD U  623.2    SURPLUS U          0.   SLACK U            0. I LOAD U     42352.
 T LOAD G  216.1    SURPLUS G          0.   SLACK G          535. I LOAD G      8664.
*************************************************************************************
           9907    PHYS EDUC      9901    HUM/F ART         .4       GRAD
           9907    PHYS EDUC      9902    SOC/BEH SC       5.3       UGRAD
           9907    PHYS EDUC      9902    SOC/BEH SC        .2       GRAD
           9907    PHYS EDUC      9905    ENGINEER          .1       GRAD
           9907    PHYS EDUC      9907    PHYS EDUC       23.2       UGRAD
           9907    PHYS EDUC      9907    PHYS EDUC        3.9       GRAD
           9907    PHYS EDUC      9909    EDUCATION        2.6       UGRAD
           9907    PHYS EDUC      9910    INTERDISC        1.8       UGRAD

 T LOAD U  623.2    SURPLUS U          0.   SLACK U            0. I LOAD U     20513.
 T LOAD G  216.1    SURPLUS G          0.   SLACK G            0. I LOAD G       980.
*************************************************************************************
           9908    HEALTH SCI     9902    SOC/BEH SC        .4       GRAD
           9908    HEALTH SCI     9903    NAT SCI/MA       1.9       UGRAD
           9908    HEALTH SCI     9903    NAT SCI/MA        .8       GRAD
           9908    HEALTH SCI     9904    FD/NAT RES        .8       UGRAD
           9908    HEALTH SCI     9904    FD/NAT RES       2.8       GRAD
           9908    HEALTH SCI     9908    HEALTH SCI      25.5       UGRAD
           9908    HEALTH SCI     9908    HEALTH SCI      12.0       GRAD
           9908    HEALTH SCI     9909    EDUCATION         .1       GRAD
           9908    HEALTH SCI     9910    INTERDISC         .6       UGRAD

 T LOAD U  623.2    SURPLUS U          0.   SLACK U            0. I LOAD U     17952.
 T LOAD G  216.1    SURPLUS G          0.   SLACK G            0. I LOAD G      3466.
*************************************************************************************
           9909    EDUCATION      9901    HUM/F ART       20.1       UGRAD
           9909    EDUCATION      9902    SOC/BEH SC      19.3       UGRAD
           9909    EDUCATION      9902    SOC/BEH SC       5.7       GRAD
           9909    EDUCATION      9903    NAT SCI/MA       1.1       GRAD
           9909    EDUCATION      9908    HEALTH SCI       2.7       GRAD
           9909    EDUCATION      9909    EDUCATION        4.9       UGRAD
           9909    EDUCATION      9909    EDUCATION       68.7       GRAD

 T LOAD U  623.2    SURPLUS U          0.   SLACK U            0. I LOAD U     27629.
 T LOAD G  216.1    SURPLUS G        536.   SLACK G            0. I LOAD G     16331.
*************************************************************************************
           9910    INTERDISC      9901    HUM/F ART       46.1       UGRAD
           9910    INTERDISC      9901    HUM/F ART         .7       GRAD
```

TABLE 4 - CONTINUED

DEPT J	NAME	DEPT I	NAME	FTE FAC	LEVEL
9910	INTERDISC	9902	SOC/BEH SC	14.8	UGRAD
9910	INTERDISC	9902	SOC/BEH SC	.2	GRAD
9910	INTERDISC	9904	FD/NAT RES	7.8	UGRAD
9910	INTERDISC	9904	FD/NAT RES	.5	GRAD
9910	INTERDISC	9905	ENGINEER	14.0	UGRAD
9910	INTERDISC	9907	PHYS EDUC	.4	GRAD
9910	INTERDISC	9908	HEALTH SCI	1.6	UGRAD
9910	INTERDISC	9909	EDUCATION	.1	GRAD
9910	INTERDISC	9910	INTERDISC	4.0	UGRAD
9910	INTERDISC	9910	INTERDISC	1.2	GRAD

```
T LOAD U    623.2   SURPLUS U          0.   SLACK U           0. I LOAD U     55078.
T LOAD G    216.1   SURPLUS G          0.   SLACK G           0. I LOAD G       660.
```

FIGURE 3 - FACULTY TEACHING LOAD EQUILIZATION MODEL WITH PREFERENCE GOAL

MINIMIZE:

$$\sum_{j=1}^{N} {}_U W_j \left({}_U S_j^+ + {}_U S_j^-\right) + {}_G W_j \left({}_G S_j^+ + {}_U S_j^-\right) + \sum_{i=1}^{N} {}_P W_i \, {}_P S_i^- \tag{0}$$

SUBJECT TO:

$${}_U L_j \sum_{i=1}^{N} {}_U T_{i,j} \, {}_U X_{i,j} - {}_U S_j^+ + {}_U S_j^- = {}_U I_j \qquad \text{for } j = 1, 2, \ldots N \tag{1}$$

$${}_G L_j \sum_{i=1}^{N} {}_G T_{i,j} \, {}_G X_{i,j} - {}_G S_j^+ + {}_G S_j^- = {}_G I_j \qquad \text{for } j = 1, 2, \ldots N \tag{2}$$

$$\sum_{j=1}^{N} {}_U D_{i,j} \, {}_U T_{i,j} \, {}_U X_{i,j} + \sum_{j=1}^{N} {}_G D_{i,j} \, {}_G T_{i,j} \, {}_G X_{i,j} + {}_P S_i^- = P_i \qquad \text{for } i = 1, 2, \ldots N \tag{3}$$

$$\sum_{j=1}^{N} {}_U T_{i,j} \, {}_U X_{i,j} + \sum_{j=1}^{N} {}_G T_{i,j} \, {}_G X_{i,j} = F_i \qquad \text{for } i = 1, 2, \ldots N \tag{4}$$

$${}_U T_{i,j} \, {}_U X_{i,j} \leq {}_U T_{i,j} \, F_i \qquad \text{for } i,j = 1, 2, \ldots N \tag{5}$$

$${}_G T_{i,j} \, {}_G X_{i,j} \leq {}_G T_{i,j} \, F_i \qquad \text{for } i,j = 1, 2, \ldots N \tag{6}$$

$${}_U X_{i,j} \geq 0 \quad {}_G X_{i,j} \geq 0 \qquad \text{for } i,j = 1, 2, \ldots N \tag{7}$$

WHERE:

${}_U D_{i,j}$ = index of desirability of teaching at the undergraduate level for faculty from department i in department j

${}_G D_{i,j}$ = index of desirability of teaching at the graduate level for faculty from department i in department j

P_i = faculty preference for department i

${}_{p}S_{i}^{-}$ = surplus variable for preference for department i

${}_{U}W_{j}$ = relative weight of instruction at the undergraduate level in department j

${}_{G}W_{j}$ = relative weight of instruction at the graduate level in department j

${}_{p}W_{i}$ = relative weight of faculty preference in department i

TABLE 5 - FTE FACULTY, TEACHING LOADS, INSTRUCTIONAL LOADS, AND WEIGHTS (EXTENDED MODEL)

```
DEPART     NAME       FTE FAC   T LOAD U   T LOAD G   I LOAD U  I LOAD G
                      WGT PRE                         WGT IL U  WGT IL G

 3901   HUM/F ART      363.3     623.2      216.1     120995.     9286.
                       800.                                1.        3.
 3902   SOC/BEH SC     176.9     623.2      216.1      91426.     9489.
                       800.                                1.        3.
 3903   NAT SCI/MA     264.3     623.2      216.1     117489.    11403.
                       800.                                1.        3.
 3904   FD/NAT RES     118.7     623.2      216.1      68245.     6292.
                       800.                                1.        3.
 3905   ENGINEER        90.0     623.2      216.1      19638.     4634.
                       800.                                1.        3.
 3906   BUSINESS        68.5     623.2      216.1      42352.     8664.
                       800.                                1.        3.
 3907   PHYS EDUC       33.2     623.2      216.1      20513.      980.
                       800.                                1.        3.
 3908   HEALTH SCI      50.2     623.2      216.1      17952.     3466.
                       800.                                1.        3.
 3909   EDUCATION       84.2     623.2      216.1      27629.    16331.
                       800.                                1.        3.
 3910   INTERDISC       13.0     623.2      216.1      55078.      660.
                       800.                                1.        3.
```

demonstrate the effects of the faculty preference goal and differing weights for undergraduate and graduate instructional loads.

The values of the index of desirability of teaching were set equal to the index of shared teaching in Table 3.

Table 6 contains the optimal solution of the model for the data just described. There is more imbalance in this solution than in the one shown in Table 4. There is a surplus of 5201 SCH at the undergraduate level in Humanities and Fine Arts, a surplus of 10354 SCH at the undergraduate level in Engineering, and a slack of 15632 SCH at the undergraduate level in Business. This represents an imbalance of 25.1 FTE faculty system wide.

The increased imbalance in this solution resulted from the addition of the goal of satisfying faculty preference. The imbalance appears at the undergraduate level due to the increased weight given to satisfying demand for instruction at the graduate level relative to the undergraduate level.

VII. Conclusion - Value of the Model

The goal programming formulation of the faculty teaching load equalization problem provides one approach to resolving the imbalances in faculty teaching loads that develop in an environment of changing program enrollments and restrictive faculty recruitment policies.

For the data used in testing, which came from a real setting, significant reductions in teaching load variations resulted from application of the model. While the results are not conclusive, they do demonstrate the potential inherent in this approach.

Also, it has been shown that it is possible to incorporate faculty preferences in the model. With this addition, the need for differentially weighting faculty preferences and instructional loads becomes apparent.

Hence, in one model three elements of short-range instructional planning have been combined. They are (1) the demand for instruction, (2) the faculty available to satisfy the demand, their workloads, and their preferences, and (3) the priorities for resolving conflict between the first two elements.

TABLE 6 - OPTIMAL SOLUTION (EXTENDED MODEL)

```
               DEPT J     NAME      DEPT I     NAME      FTE FAC    LEVEL

                9901    HUM/F APT    9901   HUM/F APT    202.6      UGRAD
                9901    HUM/F APT    9901   HUM/F ART     43.0      GRAD

    T LOAD J    623.2    SUPPLUS U     5231.  SLACK U           0. I LOAD U    120395.
    T LOAD G    216.1    SURPLUS G       0.   SLACK G           0. I LOAD G      9236.
*************************************************************************************
                9902    SOC/BEH SC   9901   HUM/F ART      9.5      UGRAD
                9902    SOC/BEH SC   9902   SOC/BEH SC   133.0      UGRAD
                9902    SOC/BEH SC   9902   SOC/BEH SC    43.9      GRAD
                9902    SOC/BEH SC   9908   HEALTH SCI     4.2      UGRAD

    T LOAD J    623.2    SURPLUS U       0.   SLACK U           0. I LOAD U     91426.
    T LOAD G    216.1    SURPLUS G       0.   SLACK G           0. I LOAD G      9489.
*************************************************************************************
                9903    NAT SCI/MA   9903   NAT SCI/MA   188.5      UGRAD
                9903    NAT SCI/MA   9903   NAT SCI/MA    52.8      GRAD

    T LOAD J    623.2    SURPLUS U       0.   SLACK U           0. I LOAD U    117489.
    T LOAD G    216.1    SURPLUS G       0.   SLACK G           0. I LOAD G     11423.
*************************************************************************************
                9904    FD/NAT RES   9901   HUM/F APT     19.9      UGRAD
                9904    FD/NAT RES   9904   FD/NAT RES    69.6      UGRAD
                9904    FD/NAT RES   9904   FD/NAT RES    29.1      GRAD

    T LOAD J    623.2    SURPLUS U       0.   SLACK U           0. I LOAD U     68245.
    T LOAD G    216.1    SURPLUS G       0.   SLACK G           0. I LOAD G      6232.
*************************************************************************************
                9905    ENGINEER     9905   ENGINEER      48.1      UGRAD
                9905    ENGINEER     9905   ENGINEER      21.4      GRAD

    T LOAD J    623.2    SURPLUS U    10354.  SLACK U           0. I LOAD U     19538.
    T LOAD G    216.1    SURPLUS G       0.   SLACK G           0. I LOAD G      4534.
*************************************************************************************
                9906    BUSINESS     9901   HUM/F ART      4.4      UGRAD
                9906    BUSINESS     9901   HUM/F ART       .7      GRAD
                9906    BUSINESS     9903   NAT SCI/MA     3.2      UGRAD
                9906    BUSINESS     9903   NAT SCI/MA     1.6      GRAD
                9906    BUSINESS     9905   ENGINEER       1.6      UGRAD
                9906    BUSINESS     9905   ENGINEER       1.8      GRAD
                9906    BUSINESS     9906   BUSINESS      33.3      UGRAD
                9906    BUSINESS     9906   BUSINESS      35.2      GRAD
                9906    BUSINESS     9907   PHYS EDUC      0.0      GRAD
                9906    BUSINESS     9908   HEALTH SCI      .4      UGRAD
                9906    BUSINESS     9908   HEALTH SCI      .8      GRAD
                9906    BUSINESS     9909   EDUCATION      0.0      GRAD
                9906    BUSINESS     9910   INTERDISC      0.0      UGRAD

    T LOAD J    623.2    SURPLUS U       0.   SLACK U       15632. I LOAD U     42352.
    T LOAD G    216.1    SURPLUS G       0.   SLACK G           0. I LOAD G      8664.
*************************************************************************************
                9907    PHYS EDUC    9901   HUM/F APT      1.3      UGRAD
                9907    PHYS EDUC    9905   ENGINEER       3.0      UGRAD
                9907    PHYS EDUC    9907   PHYS EDUC     28.7      UGRAD
                9907    PHYS EDUC    9907   PHYS EDUC      4.5      GRAD

    T LOAD J    623.2    SURPLUS U       0.   SLACK U           0. I LOAD U     20513.
    T LOAD G    216.1    SURPLUS G       0.   SLACK G           0. I LOAD G       388.
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"IF ONLY THEY WOULD LISTEN . . ."
ACADEMIC DECISIONMAKERS AND INSTITUTIONAL RESEARCHERS

Andrew T. Ford
New Hampshire College and University Council

Who's not listening, academic decisionmakers or institutional researchers? To put it another way, who's not talking clearly or effectively. The answer, in a word, is both--for academic decisionmakers as well as institutional researchers are neither listening, nor talking, to one another. Exceptions to this assertion, and others that follow, undoubtedly abound, but they may be the exceptions that prove the rule. In any case, I begin this afternoon's presentation with the premise that more often than not these parties do not communicate, and that those who do can always use help in sharpening their listening and communicating skills. I shall now review why they don't listen to one another, suggest how institutional researchers can improve this situation, and conclude by identifying several vital areas where improved communication may be critical to an institutional's survival.

Put most simply, academic decisionmakers don't listen to what institutional researchers have to say because they are not interested. Trained in traditional academic disciplines and having scaled career ladders anchored to that discipline with rungs made of serving on committees, teaching within the department, and publishing within the field, these individuals, for the most part, have not developed a sustained interest in higher education as a field worth studying. Moreover, their very success prompts skepticism about the need for such an interest. This skepticism extends to institutional researchers as representatives of this specialized interest in higher education, and perhaps helps explain the disdain with which traditional academics view Ed.D. degrees.

Apprehension strengthens this disdain. Apprehension that the on-the-job training received (that is, the administrative and managerial skills developed, however inadvertently) might be inadequate to the task and exposed through the efforts of the institutional researcher. Remember in this context that the majority of academic administrators inhabit a world of waiting: chairmen are waiting to be deans, deans are waiting to be vice presidents or provosts, and provosts to be presidents or chancellors. Under these conditions, research that so much as suggests less than perfect performance threatens the academic decisionmaker.

Institutional researchers should be aware of another fear that they awaken in academic administrators--the fear that institutional studies will unleash, albeit unintentionally, dark, disruptive, even disastrous forces among the faculty. Having risen from the ranks, so to speak, academic decisionmakers believe only they have their finger on the faculty's pulse, and they live in almost constant fear that it will be quickened to stroke proportions by an unwitting institutional analysis.

For these reasons, and obviously others, academic decisionmakers are not especially interested in what institutional researchers have to say. To make matters worse, some academics are disinterested--that is, they consciously disavow the products of institutional research. I recall an academic vice president telling the representatives from SRG's Campus VIII that he didn't care how good the data and reports were, they still would make no difference in the way he ran his college. The reasons for such disinterest are fairly complex, yet one stands out rather clearly. It is that academics distrust the results of institutional research (perhaps because they want to); thus they focus on, and enjoy retelling, stories of bad data or reports. The current tale making the rounds, and one that is surely apocryphal, begins by observing that City University of New York enrollments are down 17% this year. It then tells of how the first study prepared at CUNY analyzing the financial impact of imposing tuition failed to build in a student attrition factor that would result from this major policy change. True or not, it seems certain that all institutional researchers are suffering from a bad press.

A bad press notwithstanding, institutional researchers are not free of blame for academics not listening. While we all appreciate the utility of multi-purpose survey instruments, we should be cautious about relying upon multi-purpose reports, for they tend to have minimal impact. Recipients of such documents, especially when they are indisposed to begin with, simply will not sift through the layers, columns, or rows of data in search of what they consider relevant. The impact--or, if you prefer, readability--is further reduced when insufficient care and attention is devoted to the report's format. I fancy myself an advocate for institutional research, yet even I sometimes think your reports are designed principally for professional colleagues elsewhere, rather than the particular intra-institutional audience. A related point centers on the report's significance. Researchers, in my view, can be neither too basic nor too elementary when explaining the significance of their data. Indeed, a good rule of thumb might be that if a report is so elementary that you would be embarrassed to share it with a fellow institutional researcher, then it is ready to be released.

Concerns for format and significance should obviously take into account the audience for whom the report is intended. I recall an academic dean who for several years had been receiving from the registrar's office semi-annual reports on student attrition. As soon as they hit her desk, she quickly scrawled "file" in the top, right-hand corner and fed them to the "out" baskket. Not until the report title was changed from "student attrition" to "student retention and attrition" did she finally bother to look inside. It turns out that she felt that attrition was the Director of Admissions and the Dean of Students problem, while retention was her concern since retained students received the education for which she felt responsible. Hers is surely a naive or narrow view, and hopefully one that is not too common, but institutional researchers must be aware of, and alert to, nuances of this sort if they want academics to listen.

Let's now shift gears slightly and discuss why institutional researchers don't listen to academic decisionmakers. In some respects, the following is a mirror image of my earlier comments about academic decisionmakers as nonlisteners. Thus, for example, institutional researchers aren't listening because they are not especially interested in what academics have to say. Through either formal or on-the-job training, institutional researchers cultivate a professional interest in higher education as a field of study. As sophisticated, highly trained students, they frequently have little faith in, and less patience for, people who have merely worked their way up the ranks, without benefit of formal training and without, at least by implication, acquiring the overview institutional researchers deem essential for really understanding how the institution works and ought to work. At best, this impatience comes through as a kind of conceit concerning what is important and what has to be done; at worst, it transmits a rather condescending and hence offensive attitude.

Allow me to illustrate this point with a short, but true, example. The chairman--let's call him Professor Hui of the Oriental Languages Department at a southern university--asked the institutional researcher, Dr. Jones, to ascertain the cost of teaching Classical Chinese over each of the last three years and to compare these costs to the teaching of other languages in this and other departments. Dr. Jones, at that time, was deeply immersed in a crash program, ordered by the President, to identify ways of reducing that year's operating budget so as to erase a projected deficit of $250,000. In addition, with the end of the first semester drawing rapidly to a close, he knew his staff would soon be deluged by student evaluation of teaching forms that had to be processed according to a previously agreed upon timetable. Unfortunately, however, instead of identifying these constraints, Dr. Jones chose simply to inform Professor Hui that institutional priorities prevented him from fulfilling the request in the immediate future, but that if Professor Hui resubmitted it in the spring, he (Dr. Jones) would see what he could do. Subsequent conversations made clear that Professor Hui left this encounter thinking he had been brushed off by the institutional researcher whose job, whatever it was, was not to support the concerns of department chairmen unless and until it had nothing better to do.

Another reason institutional researchers tend not to listen to academic decisionmakers is that they are not deeply interested in institutional politics. They believe the data ought to stand by itself and, if you will, speak for itself, whereas academics want constantly to review the political context because it not only colors the data, but also occasionally obliterates it altogether. From this position, unfortunately, some institutional researchers slip over the precipice and fall into the pit of believing that the data or report is the decision itself, that there are no alternatives to it. When this happens, storms break out all over.

Most of us know of at least one liberal arts college attempting to develop career emphases, while continuing rather traditional programs which, by any measure, are not carrying their weight. Yet, when institutional researchers confront the dean or vice president with this fact, he or she stubbornly refuses even to consider terminating the program simply because he or she believes such programs are essential to what a college is all about, that there would not be a "true college" left if these programs were rolled back or eliminated. It will be a long time before data overcomes this stubborness, a stubborness with which, by the way, I have a good deal of sympathy. At any rate, incidents such as these remind us all that there is a huge difference between a report and a decision.

Continuing the mirror image, academic decisionmakers also are not free of blame for institutional researchers not listening. Recalling academic decisionmakers' previously discussed attitudes toward institutional researchers, we should not be surprised that they tend to be rather circumspect in dealing with you. Fearful of being embarrassed by the expertise of others and unwilling to share the political details of what they are up to, they frequently will give you only a piece of the problem. Yet, they nevertheless hope that you will develop the entire picture or answer they seek. In this context, watch for sudden changes of heart. If, for example, the chairman or dean, out of a clear blue sky, suddenly desires specialized reports on teaching effectiveness, be sure you, for your own sake as well as the institution's, know whether the intent is to save or get rid of a particular professor.

Academic decisionmakers contribute further to the lack of communication by using jargon, jargon they are personally unfamiliar with. I think of the provost who used the terms "headcount faculty" and "F.T.E. Faculty" interchangeable, until he attacked the work of the vice president for institutional research once too often at the president's staff meeting. A knife could slice the silence that descended upon that meeting when the vice president showed the provost the error of his ways.

Finally, academic decisionmakers contribute to the lack of communication by frequently not knowing how to pose questions adequately. Precisely because they are not specialists, they do not know how to phrase concerns and questions with words that are instantly meaningful to institutional researchers. Perhaps the best story to illustrate this point is the academic dean whom our office approached about pilot testing the utility and cost effectiveness for small, liberal arts colleges of a computer generated induced course load matrix. After a significant investment of time and energy, he finally relented and we went ahead and collected the data. Only after we returned with the completed reports did he finally realize--or at least admit--that he had been doing

ICLM's for years...by hand. The point of this story, of course, is that he felt the need for this information, but didn't know how to express it in meaningful terms.

Thus it appears that neither institutional researchers nor academic decisionmakers are listening to one another. At this juncture, it seems appropriate to discuss what institutional researchers, as opposed to academic decisionmakers who are not here, can do to improve this situation.

Some of the points I would make under this heading are obvious and have been mentioned earlier: when possible, stop generating multi-program data reports; analyze the audience or recipients before deciding upon a format and issuing a study; be alert to the unintended consequences--especially political consequences--of what you are doing; and find out the real purpose of what you are being asked to do.

In addition to these specific points, there are a couple of more general ones I would like to touch upon lightly. Since we are all in the education business, it seems especially appropriate that we try to teach one another. In the context of these remarks, this means that I am suggesting that you consciously adopt the role of teacher as well as the more traditional role of a support service. Steel up the courage, take the time, and try to teach your academic colleagues about what you can do and what you cannot do. But don't undertake this task lightly--first study the literature on intervention and teaching strategies and then develop a plan of attack most suited to the audience.

This recurring theme of knowing your audience brings to mind an observation offered by David Reisman. In a discussion concerning the best way to train educational administrators, he suggested that you should start with people educated in cultural anthropology. For cultural anthropologists know how to draw meaning from the artifacts of a civilization and, hence, have an edge in discerning signals put forward by people working in complex organizations. They have, in other words, some skill in analyzing the audience.

My second general observation or recommendation for enhancing the communication process is to, wherever possible, keep your reports institution specific. Given what we know about academic decisionmakers, we should avoid sending them abstract essays or detailed literature reviews. They are not interested in these; they do not feel they have the time to read them; and, just as importantly, they don't think you should have the time to write them. I recall the laughter--it was of the derisive, bitter variety--of a president who had requested a study on faculty workload. After waiting several months, he finally received what he expected to be an analysis of faculty workload at his institution--instead, he got a detailed study of the generic options or variables one might consider in approaching this topic. Obviously, such studies are important to the quality of the institutional research being conducted. My point is simply that these works are best confined to your eyes, as background information, and seldom should see the light of day as a major part of your operational reports.

I would like to conclude today's remarks by suggesting a couple of areas that are, and will be, vitally important to institutions of higher education, and where clear communication between institutional researchers and academic decisionmakers is absolutely essential.

It is not surprising that faculty staffing is most important, for faculty comprise the heart of the institution in terms of people, money, and programs. Staffing has traditionally been important, and, if anything, will be even more so in the future, given the projections of declining enrollments. Indeed, institutional researchers and academic decisionmakers will have to work hand in glove to prepare for the 80's and 90's. And estimates of the capital investment represented by today's tenure decision will not be sufficient. Institutional researchers will have to know thoroughly the variables within the staffing or personnel system, as well as the alternatives to it, and find a way of discussing these issues in such a fashion that the results are both good for, and appropriate to, the particular institution. Since the projected crunch in the 80's will exert incredible pressure on traditional personnel systems, we must start studying and designing alternatives now.

Related to these issues of staffing patterns and personnel systems is the whole notion of faculty teaching load and faculty workload. For years these terms have been used almost interchangeably, yet the recent work of Harold Yuker, for one, clearly indicates that they are not synonymous. He has added to these discussions the idea of faculty work time--how much time do faculty actually spend working for the institution, and how is this time spread among teaching, advising, grading, and the like. Much work has still to be done in this area, but institutional researchers would be well advised to start sharing these distinctions with academic decisionmakers because they may hold the key to a practical, workable definition of faculty productivity. They may, for example, point the way toward having faculty teach additional courses because they realize there will not be a corresponding, equal increase in their actual work time. This distinction will appeal to academic decisionmakers who are naturally concerned about not overworking their faculty and may, as well, help the institution respond more flexibly to the pressures of the 1980's.

Finally, institutional researchers and academic decisionmakers are going to have to get together on collective bargaining and unionization. Although, as one commentator has suggested, unionization may be a bad idea whose time has come, there is little doubt that it is here to stay. Indeed, it has been with us quite a long time already. Yet, few institutions appear to be prepared when organizing begins at their campus. I have witnessed this process at four sharply different institutions and in no case did management have a clear idea of how much time and money it could expect to expend on the negotiations and the contract administration process. And it was not because data like this is unavailable; on the contrary, it has been published rather widely.

And this kind of concern is merely the tip of the proverbial iceberg. There are costs and trends that administrators should be aware of so they can negotiate the best possible contract for their institution. Recall, for example, the recent piece in the Chronicle of Higher Education indicating that faculty unions are becoming more concerned about job security than salaries and fringe benefits. This information can help management to anticipate the union's demands and, consequently, to prepare better for the next round of negotiations. Moreover, the kind of information illustrated by this example is especially interesting to the academic decisionmaker because it may indicate what is on the mind of his or her faculty. In providing it, the institutional researcher is speaking to the academic on his terms--faculty politics--and this may ultimately improve communication between the two all the way down the line.

If so, it will not come a minute too soon, for in a collective bargaining situation these two parties--to use the jargon of the day--must have their act together. Returning to a previous example, unionized institutions can ill afford two different definitions of what constitutes a full time faculty member, especially if key administrators don't know there are two definitions. In a situation like this, the union will naturally choose the definition most suited to its particular agenda, perhaps to the detriment of management goals. If anything, this demand for coherence is even more acute for publicly supported institutions. Public colleges, for example, that have different definitions for out-of-state students, one for internal consumption and another for the legislature, are playing with dynamite. Dynamite which, in at least one case, a disgruntled faculty member chose to ignite by tipping off several key legislators. The resulting explosion blew both the academic vice president and the director of institutional research clear out of their jobs. Hopefully, others will not have to pay such a high price for not listening.

INSTRUCTIONAL DEVELOPMENT IN HIGHER EDUCATION: GOALS, ROLES AND PROCESS

Joseph J. Durzo
New Hampshire College and University Council

Introduction

The purpose of this paper is to provide a frame of reference regarding the nature of instructional development services intended to assist faculty in improving the effectiveness and efficiency of collegiate instruction. The primary focus of the paper is on issues related to the organization and implementation of such services rather than on specific instructional design procedures or models used by various agencies.[1] No attempt is made here to review the theories, research evidence or procedures used in the design or evaluation of instruction. Consideration of these issues is beyond the scope of this paper. General reviews and discussions of these topics may be found in sources such as: Baker (1973), Baker and Schutz (1971), Diamond et al. (1975), and Gerlach and Ely (1971).

The paper consists of two major parts. Part one presents general background information about the nature of the goals and roles of instructional development agencies drawn from a review of literature. The second part summarizes the prevailing opinions from the literature about several issues which are important to the process of implementing instructional development programs.

Instructional Development--A Frame of Reference

A Definition of Instructional Development

Despite the many different points of view held on various issues by authors writing about instructional development, there is general agreement that instructional development implies some sort of systematic approach to the design or improvement of instruction. Jerry Gaff (1975 b) offered a clear, simple definition of instructional development:

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[1] For information about the nature of particular instructional development agencies see L. T. Alexander and S. L. Yelon (Eds.), Instructional Development Agencies in Higher Education. East Lansing, Mich.: Michigan State University, Learning Service, 1972.

> Instructional development is a recent academic specialization that may be defined as the systematic and continuous application of learning principles and educational technology to develop the most effective and efficient learning experiences for students. (p. 47)

When the term "instructional development" is used in this paper it will be in the sense of Gaff's definition.

Approaches to Instructional Improvement--Goals and Roles

Not all instructional improvement programs approach the task in the same manner. In fact, different agencies often view the same symptoms as relating to different problems. Following a study of instructional improvement programs for the Exxon Education Foundation, Gaff (1975 a) observed:

> Although all instructional improvement programs are designed to raise the quality of teaching and learning, these programs vary considerably. Depending on what aspects of the teaching-learning process they emphasize, they may be categorized in one of three ways: as instructional development, faculty development, or organizational development. Each category draws on different intellectual traditions, makes different analyses about what ails teaching and learning, and prescribes different solutions. (emphasis added) (p. 94)

His book describing the results of the Exxon Study (1975 b) explained the differences among the three approaches. Instructional development, he thought, focuses on "courses or curricula, and...seeks to improve the conditions and materials that promote student learning" (p. 10). He felt that the intellectual roots for this approach lay in curriculum and instruction, learning theory, educational media and technology, and systems theory. This view is generally in agreement with the views of the majority of those writing about instructional development.

He described the faculty development approach as one which "focuses on faculty members and seeks to promote their individual growth and development" (p. 8). He observed that such programs help faculty to explore their attitudes about teaching and learning and acquire more knowledge and skills related to the teaching-learning process. Gaff felt that "the intellectual underpinnings of faculty development are in clinical, developmental and social psychology, psychiatry, and the sociology of work and socialization" (pp. 8-10). The focus of this approach is on faculty members rather than the courses they teach.

Organizational development, he said, focuses on the institution as a whole or on some sub-unit such as a department or a division and "seeks to create a more effective environment within which teaching and learning can occur" (p. 10). This approach is based on organizational theory, organizational change, and group dynamics. The goal of organizational development is to develop administrative and interpersonal competencies among organization leaders and to develop policies that support teaching improvement. Table 1 summarizes the three approaches described by Gaff.

Gaff presented a useful way of distinguishing among the types of instructional improvement efforts; however, he did not attempt to evaluate the relative effectiveness of each approach in improving the teaching-learning process. He did, however, suggest that these approaches are complementary and should be combined in any comprehensive approach to the problem of instructional improvement. Diamond (1974), Buhl (1975), and others have commented on the need for a comprehensive approach to instructional improvement efforts without specifically referring to the types of categories used by Gaff.

Product Development or People Development

Professionals working within the field of instructional development are beginning to broaden the roles that their agencies play by expanding Gaff's (1975 b) definition of instructional development to include a concern for the development of faculty skills as well as the development of courses and materials. Abedor and Gustafson (1971) pointed out that any product, no matter how well designed and validated, has a relatively short useful life compared to the length of time that a faculty member will be at an institution. This is particularly true now that faculty mobility is decreasing. Consequently, they argued that, in the long run, a faculty member who is committed to instructional development and has developed his/her skills in the process is likely to make a greater contribution to the improvement of teaching and learning at an institution than will the development of any single course.

TABLE 1

ALTERNATIVE CONCEPTIONS OF INSTRUCTIONAL IMPROVEMENT

	FACULTY DEVELOPMENT	*INSTRUCTIONAL DEVELOPMENT*	*ORGANIZATIONAL DEVELOPMENT*
Focus:	Faculty members	Courses or curricula	Organization
Purpose:	Promote faculty growth; help faculty members acquire knowledge, skills, sensitivities, and techniques related to teaching and learning.	Improve student learning; prepare learning materials; redesign courses; make instruction systematic.	Create effective environment for teaching and learning; improve interpersonal relationships; enhance team functioning; create policies that support effective teaching and learning.
Intellectual base:	Clinical, developmental, and social psychology; psychiatry; socialization.	Education, instructional media and technology, learning theory, systems theory.	Organizational theory, organizational change; group processes.
Typical activities:	Seminars, workshops, teaching evaluation.	Projects to produce new learning materials or redesign courses; workshops on writing objectives, evaluating students.	Workshops for group leaders or team members, action research with work groups, task forces to revise organizational policies.

SOURCE: J. G. Gaff, Toward faculty renewal. San Francisco: Jossey-Bass, 1975, p. 9.

Beilby (1974) discussed the problem in economic terms, reasoning that the task of applying instructional development effectively to the public school setting "is too vast to be accomplished by any army of instructional developers we could realistically expect to produce" (p. 13). He also pointed out that school systems could not afford to hire the required number of instructional developers. The same problem of scale and economics applies to higher education.

There are drawbacks to the people development (or faculty development) approach. Holsclaw (1974) concluded that a development agency with a major focus on people development may not generate tangible results as quickly as agencies which focus primarily on course development. Abedor and Gustafson (1971) also pointed out the time problem, adding that "people development takes considerably more time, effort, and money while the impact is difficult to measure--or predict" (p. 22). Schauer (1971) commented that, in the past, efforts by faculty to create innovation had not been as productive as he would have hoped and argued for some method of supporting their efforts. Diamond et al. (1975) observed that academic change is never easy. They emphasized that "It is often frustrating, sometimes traumatic, and, regardless of the investment, never guaranteed. It requires talented faculty, full administrative support, and purposeful direction" (p. 3).

The solution to the problem seems to be to incorporate both emphases in an instructional development program. Abedore and Gustafson (1971), Gustafson (1971), Hoban (1974), DeBloois and Alder (1973), and others have argued persuasively that instructional development agencies must strike an effective balance between product development and people development.

The Scope of Instructional Development Projects

The literature on instructional development describes a general agreement among professionals in the field of instructional development that a systematic approach should be used to produce solutions to educational problems. The disagreement among these professionals seems, however, to relate to the size or scope of the problems to be solved by instructional development. Some instructional developers concentrate on the development of small, discrete units of instruction and others concentrate on larger projects, such as the development of entire courses or whole curricula. Eickmann (1975) suggested that one of the characteristics that differentiates among the various instructional development programs in the country is the scope of the projects undertaken. He listed five sizes of projects: (1) curriculum, (2) program, (3) course, (4) smaller than course, and (5) tiny.

Diamond (1971) made a strong plea for instructional development programs to concentrate on large-scale projects that will have major impact. This approach is often called the "major project" approach or the "concentrated" approach. The opposite approach, called the "shotgun approach," is to engage in a larger number of less intensive, smaller-scale, short-term projects. Diamond argued against the use of the shotgun approach. He felt that the goal of instructional development must be to create fundamental changes, and that to do so projects must be selected appropriately:

> Supporting numerous, small projects may make a lot of friends and keep our staff busy, but our long range impact will be minimal. This route takes too long to produce meaningful results. We should select major projects and do them well. Smaller efforts must be, in effect, pilot case studies designed to form a base for complete course or curriculum design. (p. 7)

Not all instructional developers agree that the "major project" approach is appropriate. Holsclaw (1974) interviewed a group of instructional developers, some of whom expressed the following reservations about large projects:

1. With a large project, you tie yourself up for a year and only satisfy one or two faculty members.
2. If you concentrate on one big course, you have a great impact within one department, but you end up having zero impact on other departments.
3. There are many political and financial obstacles in the way of the big projects.

(p. 97)

Within the field of instructional development, there is no universally accepted size for instructional development projects. It seems to depend on the role that each development agency sees for itself. Alexander and Yelon (1972) summarized the choices facing an instructional development agency:

> An instructional development agency can invest its resources--time, energy, and money--in a large number of small projects or in fewer, more comprehensive projects. The choice of project size should depend on its impact. A large number of relatively small instructional projects produce an impact on many departments. Fewer, larger projects produce large changes within the target departments. The main criterion is the estimated probability of success. Projects that produce no definite results, or that are not implemented, produce frustration and disillusionment. (p. 13)

Project Generation and Selection

Diamond et al. (1975) identified two major methods to generating instructional development projects--the internal approach and the external approach. In the internal approach, the staff of the agency works directly with the administration, deans, and department chairpersons to identify high priority needs and to recruit the appropriate faculty to carry out the project. Little effort is made to sell the services of the agency to the faculty at large. Rather, the focus of this approach is to support only those projects which may potentially have maximum impact on the institution. They listed the advantages and disadvantages of the internal approach:

> Advantages
>
> (1) Better balance between priorities and projects.
> (2) Fewer rejected projects.
>
> Disadvantages
>
> (1) The overall effort will begin slowly.
> (2) Requires extensive administrative cooperation at both the department and college level.
>
> (pp. 28-29)

In the external approach, a highly-publicized faculty grant program is initiated to encourage individual faculty members and departments to submit proposals for support by the agency. The scope of this support varies from agency to agency, depending on the context of the institution. The advantages and disadvantages of the external approach were also listed:

> Advantages
>
> (1) Generates many project requests.
> (2) An excellent method of advertising administrative commitment to instructional improvement.

Disadvantages

(1) Many projects will be low-priority and of questionable quality.
(2) Faculty who are turned down may be antagonized.
(3) Close control of projects may be lost unless specific operational guidelines are built into the funding process.
(4) Coordination of projects to meet specific institution-wide goals may be limited.
(5) Political considerations for institutional balance may force awarding of grants to some high-risk, low-priority projects. (p. 32)

Alexander and Yelon (1972) offered a set of four criteria which have been used to assess such proposals: "(1) the number of students affected; (2) evidence of an experimental approach; (3) potential application in other areas; and (4) the possibility of evaluation" (p. 9). They also added that the staff of the instructional development agency should stand ready to assist the faculty members in writing and carrying out the proposals. Diamond et al. (1975) went further and argued that, if quality is to be maintained with this approach, "then the control of every project must remain with the development unit rather than with the requesting department" (p. 32). They asserted that in cases where funds have been given directly to the departments without sufficient control, the results have been unsatisfactory.

DeBloois and Alder (1973) described the approach used at Utah State University which they felt combined the best aspects of the external approach with the need for developer control. The program consists of three phases of activity: Phase 1 involves awareness activities designed to make faculty aware of the available services and to circulate information about the teaching-learning process. Phase 2, faculty support activities, provides small grant awards to faculty to support limited efforts to improve their instruction and provides gratis support from the instructional development staff. Phase 3, instructional development activities, provides both financial support and assistance from the instructional development program for faculty who wish to initiate a full-scale development effort. They felt that this model represented a low-profile approach which cultivated faculty support for instructional development activities and provided for control by the instructional development agency.

Process Concerns for Implementing Instructional Development Programs

This section of the paper is an attempt to summarize the advice from the literature regarding the implementation and operation of an instructional development program. While there are many issues which must be considered in the implementation of such a program, eight of the most important ones are discussed here.

Administrative Commitment

Major academic change requires serious administrative commitment in actions as well as words. Ideally, this commitment should include: (1) financial support for the program, preferably from "hard" institutional moneys rather than from short-term grants; (2) establishment of administrative procedures that facilitate change (a new credit system, flexible classroom scheduling, etc.); (3) access to various institutional resources which may be necessary in the development process (such as computers, media support, etc.). Without a firm commitment to instructional change, the fate of any program is sealed almost before it starts (Buhl, 1975; Detweiler, 1973; Diamond, 1971; Diamond, 1974; Diamond et al., 1975; McMillan, 1975; Schauer, 1971).

Administrative Location of Instructional Development Agencies

In order to provide a catalyst for change and to support faculty in their attempts at innovation, some sort of instructional development agency or program should be established. The administrative location of such an agency or program should be such that it reports to the chief academic officer of the institution. Access to this level of administration is important since a wide-ranging instructional development program may have institution-wide impact and may necessitate institutional policy changes, reallocation of financial, material, and human resources, or may require other high-level administrative decisions and support (Alexander and Yelon, 1972; Detweiler, 1973; Diamond et al., 1975; Heinich, 1971).

Institutional Reward Structure

The institutional structure must reward faculty for quality teaching and innovation in instruction. Rewards such as campus recognition, faculty teaching awards, and the like are a step in the right direction, but they are not enough. The most effective rewards are in the nature of official recognition by the institution in terms of promotion, tenure, salary, and other marks of status. Instructional development agencies should play a part in attempting to change the institutional reward structure where necessary so that faculty may benefit in a concrete manner from their attempts at innovation (Alexander and Yelon, 1972; Buhl, 1975; Detweiler, 1973; Diamond, 1974; Diamond et al., 1975; Gaff, 1975 a, 1975 b; Group for Human Development, 1974; Hoban, 1974; Holsclaw, 1974; McMillan, 1975).

Instructional Development Procedures

There are many different "models" of instructional development processes which are followed by various instructional development agencies. Each model represents a particular individual's or agency's method of applying a systematic process to the development of instruction. Little research exists to guide an agency in selecting or developing a model to follow, but the advice from the literature seems to be clear that some sort of instructional development procedure should be adopted and followed in order to facilitate the development process and assure communication among the individuals involved (Diamond, 1971; Diamond et al., 1975; Hamreus, 1971; Holsclaw, 1974; Lee, 1971; Schauer, 1971).

Team Approach to Instructional Development

The complex nature of the academic change process and the comprehensiveness of a systematic instructional development effort require many sets of talents and areas of expertise. The use of a team approach, involving several faculty members and various professionals in instructional development and evaluation, is highly recommended as a method for bringing varied human resources to bear on this complex task (Diamond et al., 1975; Faris, 1970; Gustafson, 1971; Lee, 1971; Schauer, 1971; Wittich and Schuller, 1973).

Faculty Development

Producing meaningful, long-range academic changes in higher education requires that faculty be effectively involved in the instructional development program. Attention should be paid to the development of faculty members' skills in instructional development. The majority of opinions offered suggest that a major goal of any successful program should be for faculty to become instructional developers in their own right (Abedor and Gustafson, 1971; Beilby, 1974; Briley, 1971; DeBloois and Alder, 1973; Faris, 1970; Gaff, 1975 b; Group for Human Development, 1974; Gustafson, 1971; Gustafson, 1975; Hoban, 1974; Roueche and Boggs, 1970; Ullmer and Stakenas, 1971).

Various workshops and training sessions have been advanced as ways to achieve this objective; however, little data about the long-term effectiveness of these approaches are available. Hammons (1975) reported that short-term workshops by themselves have not proven to be effective in producing long-range change. He suggested that certain follow-up activities be included in order to maximize the impact of workshops. In addition, he listed a set of guidelines to be followed in the development of workshops intended to improve faculty skills in the teaching-learning process.

Maximizing Impact

To have maximum impact on institutional programs, instructional development agencies should identify the top priorities of the institution and choose projects which reflect these priorities. The goal should be to complete a few major projects which have widespread impact rather than to support numerous small projects which have little overall impact on the nature of the academic program. In addition, every possible attempt should be made to assure the long-term stability of the project. A key first step in the process is to select projects from departments where the staffing pattern is relatively stable and where the political climate is free from divisive problems which would eventually doom any project to failure. Another step toward stability is the involvement of more than one faculty member in the project, thereby assuring that other faculty members will be able to carry on the project even if a key person leaves the institution. Finally, the agency should structure the conditions for institutional support of the project so that after the developmental stage is completed the institution will continue to support the new course as a part of its normal academic program (Diamond, 1971; Diamond et al., 197; Haney, Lange, and Barson, 1968).

Include Evaluation

The consensus in the literature is clear that any instructional development effort must include evaluation. Evaluation can help insure more successful projects by informing the development process, but it is also important to assist the institution in judging the worth of the instructional improvement enterprise. Without adequate evaluation, it is not possible to describe accurately what was accomplished. Instructional changes, attitude changes, program effectiveness and efficiency, student learning, and faculty attitudes should all be examined as a part of the evaluation process (Diamond, 1971; Diamond et al., 1975; Engel, 1969; Gaff, 1975 b; Gerlach and Ely, 1971; Gustafson, 1971; Hamreus, 1971; Holsclaw, 1974; Lee, 1971; Popham, 1974; Schauer, 1971; Wittich and Schuller, 1973).

REFERENCES

Abedor, A. J., & Gustafson, K. L. Evaluating Instructional Development Programs: Two Sets of Criteria. *Audiovisual Instruction*, 1971, *16* (10), 21-25.

Alexander, L. T., & Yelon, S. L. (Eds.) *Instructional Development Agencies in Higher Education*. E. Lansing, Mich.: Michigan State Univ., Learning Service, 1972.

Baker, E. L. The Technology of Instructional Development. In R. M. W. Travers (Eds.), *Second Handbook of Research on Teaching*. Chicago: Rand-McNally, 1973.

Baker, R. L. & Schutz, R. E. (Eds.) *Instructional Product Development*. New York: Van Nostrand Reinhold, 1971.

Beilby, A. E. Instructional Development in the Public Schools--Whose Job? *Educational Technology*, 1974, *14* (1), 11-16.

Briley, T. S. The E D O and the Able System for Instructional Improvement. *Audiovisual Instruction*, 1971, *16*, (10), 39-42.

Buhl, L. C. A Personal Assessment of the State of Instructional Development. *Educational Consulting Study Newsletter*, 1975, January, 2-7.

DeBloois, M., & Alder, D. Stimulating Faculty Readiness for Instructional Development: A Conservative Approach to Improving College Teaching. *Educational Technology*, 1973, 13, (7), 16-19.

Detweiler, M. J. *"Instructional Development" at Sangamon State University*. Springfield, Ill.: Sangamon State University, 1973.

Diamond, R. M. Instructional Development: Fact or Fiction? *Audiovisual Instruction*, 1971, *16* (10), 6-7.

Diamond, R. M. Academic Redesign in Higher Education--A Matter of Survival. *Audiovisual Instruction*, 1974, *19* (10), 6-8.

Diamond, R. M., Eickmann, P. E., Kelley, E. F., Holloway, R. E., Vickery, T. R., and Pascarella, E. T. *Instructional Development for Individualized Learning in Higher Education*. Englewood Cliffs, N. J.: Educational Technology Publications, 1975.

Eickmann, P. Some Critical Dimensions in Differentiating Between Instructional Development Efforts. Document prepared for the Sagamore Seminar on Instructional Development in Higher Education, July 21, 1975, sponsored by Syracuse University, Center for Instructional Development.

Engel, D. J. A Study to Determine the Status of Instructional Development Programs Within Institutions of Higher Education (Doctoral dissertation, Indiana University, 1969). *Dissertation Abstracts International*, 1970, *30*, 3185-A. (University Microfilms No. 70-1913).

Faris, G. Faculty Development--The Key to Instructional Development. In *Development--Significant Response to Education's Problems*. Bloomington, Indiana: Indiana University, School of Education, 1970.

Gaff, J. G. New Approaches to Improve Teaching. In D. W. Vermilye (Ed.), *Learner-Centered Reform*. San Francisco: Jossey-Bass, 1975. (a)

Gerlach, V. S., & Ely, D. P. *Teaching and Media: A Systematic Approach*. Englewood Cliffs, N. J.: Prentice-Hall, 1971.

Group for Human Development in Higher Education. *Faculty Development in a Time of Retrenchment*. New Rochelle, N. Y.: *Change* Magazine, 1974.

Gustafson, K. L. Toward a Definition of Instructional Development: A Systems View. Paper presented at the annual meeting of the Division of Instructional Development of the Association for Educational Communications and Technology. Philadelphia, March, 1971.

Gustafson, K. L. Improving Instructional Development: Faculty as Learners. *Educational Technology*, 1975, *15* (5), 34-38.

Hammons, J. O. How Effective are Short-term Faculty Workshops? *Audiovisual Instruction*, 1975, *20* (10), 26-50.

Hamreus, D. G. Toward a Definition of Instructional Development: An Organizational Approach. Paper presented at the annual meeting of the Division of Instructional Development of the Association for Educational Communications and Technology, Philadelphia, March, 1971.

Haney, J. B., Lange, P. C., & Barson, J. The Heuristic Dimension of Instructional Development. *A V Communication Review*, 1968, *16*, 358-371.

Heinich, R. Toward a Definition of Instructional Development: An Eclectic Approach. Paper presented at the annual meeting of the Division of Instructional Development of the Association for Educational Communications and Technology, Philadelphia, March, 1971.

Hoban, D. J. Faculty Development--A Needed Perspective in I. D. *Audiovisual Instruction*, 1974, *19* (10), 20-21.

Holsclaw, J. E. The Development of Procedural Guidelines for the Systematic Design of Instruction Within Higher Education (Doctoral dissertation, University of Southern California, 1974). *Dissertation Abstracts International*, 1974, *35*, 1873-A. (University Microfilms No. 74-21,479).

Lee, A. M. An Administrator's Guide to Instructional Development. *Audiovisual Instruction*, 1971, *16* (10), 18-20.

McMillan, J. H. The Impact of Instructional Improvement Agencies in Higher Education. *Journal of Higher Education*, 1975, *46*, 17-23.

Popham, W. J. Higher Education's Commitment to Instructional Improvement Programs. *Educational Researcher*, 1974, *3* (11), 11-13.

Roueche, J. E. & Boggs, J. R. *The Educational Development Officer--A Change Catalyst for Two-Year Colleges*. Durham, North Carolina: Regional Education Laboratory for the Carolinas, 1970, ED # 043 317.

Schauer, C. A Vice-President Looks at Instructional Development. *Audiovisual Instruction*, 1971, *16* (10), 43-45.

Ullmer, E. J., & Stakenas, R. G. *Instructional Development Handbook*. Tallahassee, Fla.: Florida State University, Division of Instructional Research and Service, Instructional Development Center, 1971.

Wittich, W. A., & Schuller, C. F. *Instructional Technology: Its Nature and Use*. New York: Harper & Row, 1973.

IDENTIFYING DROP OUTS, STOP OUTS AND PERSISTERS BY AFFECTIVE CHARACTERISTICS

David Nichols
SUNY at Buffalo

To be able to identify the behaviors, attitudes and characteristics of students who drop out of college would be of great benefit to everyone, from the university to the student involved. Some researchers (Fenstemacher, 1973; Suczek and Alfert, 1966; and others) have attempted to describe the typical dropout, while others (e.g. Astin, 1975) have even tried to predict which students will drop out. For example, some variables found to be a factor are as specific as whether or not the person smokes or keeps his desk tidy. In predicting the future we, as researchers, play the role of soothsayer with the hopes of facilitating the lives of students, teachers and administrators.

The most comprehensive and definitive statement about college dropouts has been made by Alexander Astin. He has devised a formula which attempts to predict which college students will stop out and drop out. The predictors most frequently examined by Astin and others have been objective and behavioral in nature, SAT scores or study habits, for example, Although high school grade point average has proven to be the single best predictor of attrition and college "success," a major part of a person's life and personality, his affective characteristics, has been virtually ignored by researchers. Such dimensions as relationships with parents, or satisfaction with high school experiences influence a person's behavior and should be investigated relative to potential dropping out of college. This paper examines some of those affective characteristics and the relationship they have to students' dropping out of college.

Procedure

The population in this study was 1506 entering freshmen at State University of New York at Buffalo (SUNY/B) in September, 1973. During their summer orientation program they completed the College Student Perception Survey (CSPS), a questionnaire developed by the Office of Student Testing and Research. Three years later in August, 1976, a list of all 1973 freshmen was obtained indicating how many credit hours they completed for each of the six semesters from September 1973 to May 1976. This list was then analyzed according to the results of the 1973 CSPS.

The Questionnaire

The 1973 CSPS consisted of 18 pages of multiple choice questions covering several different aspects of a student's life, e.g. high school experiences, career plans, relationship with family, interpersonal relationships and self description.

Data Analysis

Three years after entering SUNY/B, each student was categorized as either a persister, a stopout or a dropout. These categories, borrowed from Astin terminology (1975) were defined as follows: a persister was any student who completed not less than three credit hours every fall and spring semester from September 1973 to May 1976. A stopout was any student who completed no credit hours for at least one fall or spring semester from September 1973 to Fall 1975 but returned no later than Spring semester 1976 to complete three or more credit hours. A dropout was defined as any student who completed no credit hours for a fall or spring semester from September 1973 to May 1976 and continued to complete no credit hours from that semester to May 1976.

Following this categorization, each group was analyzed according to its responses on several variables of the CSPS. The variables examined were:

1. satisfaction with high school experiences
2. frequency of association with various categories of people
3. understanding the values of those people
4. comfort in associating with those people
5. description of family life
6. relationship with father
7. relationship with mother
8. number of siblings
9. description of self
10. understanding of self

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Responses to each item were analyzed to determine whether significant differences existed among persisters, stopouts and dropouts at the .05 level of confidence. Results were also analyzed to determine differences in the responses of males and females for each category. Chi square statistics were calculated for items with categorical responses and t-tests were used for items answered on a continuum.

The population consisted of 1102 persisters, 140 stopouts and 264 dropouts.[1]

Results

Considering the number of variables examined (10 major areas with a total of 93 variables), few significant differences were found among persisters, stopouts and dropouts. Even for those cases where differences did occur, the sample size was so large that statistical significance showed up for fairly small differences among means. Consequently, in interpreting the results one must ask what that difference means to him as a researcher or administrator.

Satisfaction with High School Experiences

Freshmen indicated on a four-point scale how satisfied they were with eleven areas associated with high school. The areas examined were academic, social and extracurricular activities; relationships with peers, teachers and administrators; and the degree of effort invested in these activities and relationships. The scale ranged from "very dissatisfied," "moderately dissatisfied," "moderately satisfied" to "very satisfied."

Overall, persisters differed from dropouts in only two areas: academic experience and amount of effort put into academic work in high school. Both male persisters and female persisters were more satisfied with their academic experience than dropouts. Also, female persisters were considerably more satisfied with the amount of effort they had put into their academic work than either stopouts or dropouts, while the males in the three categories were equally satisfied. Not surprisingly, it appears that persisters view the academic aspects of high school more favorably then do dropouts and stopouts.

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[1] Those interested in obtaining additional information contained in tables, write to the author.

Aside from these academic differences, agreement was reached on all other satisfaction variables. The two most satisfying experiences for all three groups were relations with peers of the same sex and the degree of effort they had made in establishing relations with them. Both stopouts and dropouts felt that relations with students of the opposite sex were the third most satisfying experience while persisters chose academic experience. Perhaps this has some meaning in that stopouts and dropouts may have spent more time socializing while persisters were more content to stay home and study.

Interpersonal Relationships

The next three variables examined in this study dealt more specifically with students' interpersonal relationships. For the first one, they indicated on a five-point scale how frequently they associated with certain groups of people which included peers, adults, children, elderly people, teachers and people of a different race, religion and socioeconomic status. The scale ranged from "not at all," "rarely," "occasionally," "frequently," to "daily or almost daily."

Male persisters differed from dropouts in that they associated more frequently with peers of the same sex. On the other hand, female dropouts were more inclined to associate with people of a different race than were persisters and stopouts. This finding seems to indicate a more nonconventional, perhaps open-minded attitude on the part of both male and female dropouts. Also indicative of a more mature attitude were male stopouts' tendency to associate more frequently with people from a "different socioeconomic background." However, despite these differences when looking at the three types of people most frequently associated with, they are almost identical. The most frequent associations for all three groups are peers of the same sex, people of different religion and peers of opposite sex.

The second interpersonal variable was concerned with understanding the values of others. Options ranged from "not well at all," "not very well," "fairly well" to "very well." There were no significant differences among persisters, stopouts and dropouts along this variable. Similarly, they all agreed overwhelmingly that they understood the values of their peers of the same sex best.

Likewise, no significant differences existed among the three groups in their degree of comfort in associating with people or groups of people. However, male stopouts were more comfortable than dropouts in their associations with people from a different socioeconomic background. In their associations with elderly people, male persisters were more uncomfortable than stopouts and dropouts. Once again, the three groups indicated they were most comfortable associating with peers of the same sex.

Description of Family Life

On a three-point scale ranging from "not at all descriptive," "somewhat descriptive" to "very descriptive," they indicated what their family life was like. Some of the adjectives to which they responded included affectionate, cold, loving, hostile, loyal and quarrelsome.

Somewhat surprisingly, the three groups shared very similar family lives. Not only were there no differences on any of the dimensions but all felt that "loyal," "loving" and "sharing" best described their families.

Description and Understanding of Self

Using the same three-point scale, students were asked to describe themselves according to thirty variables. Once again very few differences existed among the three categories. Persisters described themselves as more honest than dropouts and stopouts did and more self disciplined than stopouts did. The data also showed that persisters were more competitive than either stopouts or dropouts. This finding seems to indicate that persisters will strive harder for whatever goal they wish to attain. On the other hand, they rated themselves as less "independent in action" than stopouts and dropouts did, which probably means they are less willing to step out of line to do something not socially acceptable, for example, drop out. When the responses of men and women were examined separately, the profiles looked different. Male persisters indicated being more honest but less insightful than dropouts. Female persisters felt they were more competitive than did stopouts and dropouts. Despite these few differences, persisters, stopouts and dropouts viewed themselves as possessing the same traits. The five characteristics chosen as most descriptive of themselves by all three groups were "honest," "open to ideas," "open to experiences," "responsible," and "sense of humor."

In regard to their father's values and beliefs, persisters understood them better than dropouts. Students' own values and beliefs concerning politics were the least understood of all variables but significantly less understood by dropouts than persisters and stopouts.

Relationship with Mother and Father

It was hypothesized that persisters came from a more stable environment and consequently were better able to cope with the pressures of college. The criteria for measuring a stable environment were whether or not certain aspects of a relationship existed. The results supported this hypothesis, at least in part. When asked to describe their relationship with their parents, no significant differences existed among the three groups in terms of relationship with the mother, but many occurred with the father. For the seven dimensions, i.e. loyalty, humor, expression of affection, sharing of interests, helping with problems, and acceptance of other's weaknesses and values, a significantly larger percentage of persisters than stopouts and dropouts stated that each was a behavior on the part of both him or her and the father. Why relationships with mothers and fathers are quite different for persisters, stopouts and dropouts is not clearly understood at this point. Whatever the reason it appears that those people who have established a good relationship with both parents are more stable, more secure and less likely to change their environment, as demonstrated by persisters.

Conclusion

After analyzing the affective-type responses that persisters, stopouts and dropouts made on the 1973 CSPS, it is evident that not many differences exist among these students. For the most part they were equally satisfied with their high school experiences and had very similar family lives. Although they differed slightly in their association and understanding of a variety of people, they all agreed that they best understood peers of the same sex. They were also most comfortable associating with peers of the same sex. It was interesting to note that persisters, stopouts and dropouts were very similar in their descriptions of themselves. Finally, their relationships with the mother was the same for each of the three categories.

However, some differences did exist among persisters, stopouts and dropouts. The most conclusive and probably least surprising discovery in this study was that both male and female persisters were more satisfied with their high school academic experience than stopouts or dropouts. This finding is closely associated with the well-researched fact that high school grade point average is the best predictor of college persistence or attrition. Students who receive good grades are reinforced for it and consequently will be more satisfied. Because the rewards stem from doing well, they will continue to strive for them in college.

Because few differences exist among the female groups, it is difficult to make generalizations about personality types. However, the female dropouts seem to be a little more openminded in their attitudes towards different groups of people. Also, they tend to come from a slightly less comfortable home situation than persisters.

Similarly for the males, it is difficult to generalize from the results on how the three groups differ. Persisters have established a better relationship with the father. Also, they seem to be more peer-oriented while stopouts and dropouts are more likely to associate with a variety of people. Again, this may be indicative of a more mature attitude on the part of stopouts and dropouts and as Suczek and Alfert (1966) maintained, a need for a less structured and conventional environment. Persisters also indicated they were more honest but less insightful. The inference here may be that the insightful person, being less naive about his environment, views the college experience more critically in that it does not necessarily provide for a good job and a more secure future. Therefore, he or she drops out in search of something more satisfying.

This study offers a fragmented profile of persisters, stopouts and dropouts and a method for more accurately predicting a student's future. But what implications does this have as far as students, administrators and the university system are concerned?

Students are usually quite interested when someone attempts to predict their future. In addition, I believe they have the right to know what is anticipated for them. Therefore, if university personnel have information about the student which may be helpful in terms of his future, he should be informed. One should realize that informing a student that he is a potential dropout may result in a self-fulfilling prophecy or it may have the opposite effect. Regardless of its influence, it gives the student and another concerned person, hopefully his advisor, an opportunity to discuss this and other issues important to his future, e.g. why he is in college, whether it is for him, etc.

Identifying potential dropouts will also allow administrators to become more aware of students' needs and hopefully provide programs that fulfill those needs and increase their chances of staying in.

Judging from this study, programs which allow for greater academic satisfaction would be appropriate. For example, tutoring, or providing a greater variety of courses with more relevancy to student life, or work-study opportunities, especially in the community, might enhance satisfaction. In considering programs for students who have a poor relationship with the father, they might benefit from support groups or more available counseling services. Another approach which may fill this need would be to get students more naturally involved with authority figures, for example, teachers. By "naturally involved" I mean allowing students to see teachers in roles other than teaching, where they can act as role models for the students. Whether this means just a talk after class or visiting at home, this type of student needs to identify or associate with a male authority figure. By providing more of an opportunity for this interaction to occur, students' lives are likely to be enhanced.

I see several advantages to these approaches. First, administrators would be creating a university with a reputation for helping students and having its major human resource as their main concern. Second, it is economically sound. As Astin and others have pointed out, a university loses a certain amount of financial support by not receiving tuition from those who drop out. Having more students persist in college means a more solvent university. Also it cannot be argued that these programs exceed the budgetary limits for if in fact they are successful, the cost would be absorbed by those students who remain in school. Third, and perhaps the most important of all, the more students who stay, the better the chances administrators and staff have of keeping their job.

Within the last few years we have begun to realize that college is not the right place for every student with college potential. Teachers, administrators and parents should respect that. However, if a university can prevent a student from dropping out and still have the college experience be a beneficial one for him, then an effort should be made to keep him.

REFERENCES

Astin, Alexander. Preventing Students from Dropping Out. San Francisco: Jossey-Bass, 1975.

Fenstemacher, William. "College Dropouts: Theories and Research Findings." Minnesota State College System, 1973 (mimeographed).

Starr, A. M., Betz, E., Menne, J. Differences in College Student Satisfaction: Academic and Non-Academic Dropouts and Non-Dropouts. Journal of Counseling Psychology, 19, 4, 1972. 318-322.

Suczek, Robert and Alfert, Elizabeth. Personality Characteristics of College Dropouts. University of California, Berkeley, 1966 (mimeographed).

STUDENT ATTRITION AT HAMPSHIRE COLLEGE: QUALITATIVE AND POLITICAL IMPLICATIONS

Daniel L. Kegan
Hampshire College

Abstract

Fifty students sampled from the 407 who withdrew from Hampshire College during the two academic years 1973 to 1975 were interviewed by telephone. Three major factors were reported as contributing to the students' decision to withdraw. Sixty percent cited problems with educational direction or resources; twenty percent cited Hampshire's isolating social atmosphere; and fifteen percent cited cost considerations. Based on this study of withdrawals and prior studies of the quality of student life using Cycles surveys, it was also found that the College's isolating atmosphere, a dysfunctional consequence of our individualized academic program and other factors, cost the College over $100,000 in lost tuition.

A formal retention program has been instituted to try to reduce our attrition rate and to improve the quality of campus life. This several-faceted program involves greater contact with and monitoring of students, the establishment of new student support groups convened by faculty or staff, and a general campus-wide heightened awareness of our attrition problem. The extent to which fundamental contradictions in the design and operation of the College or more surface procedural issues will be addressed is currently an open question.

Student attrition has been receiving increased attention from campus administrators concerned about balancing their budgets and from administrators and researchers concerned about the deeper ills for which attrition is but a symptom. For both of these concerns Hampshire College conducted a study of its attrition.

Hampshire College, in consort with much of American higher education, has a serious problem with student retention. We lose too many students. From both the student and the institutional perspective, our attrition represents a significant cost.

Because of Hampshire's liberal leave policy and its lack of an expectation of graduation exactly four years after matriculation, our definition of withdrawal is someone who withdraws from the College and does not return to it. Hampshire's withdrawal rate (virtually all voluntary) is a fairly steady 40% per annual entering class. Because of this, each year the College has a large proportion of new students and a larger proportion of Division I students.[1] Roughly 300 students a year graduate, approximately 200 students a year withdraw. Thus, the Admissions Office must find almost double the number of qualified applicants than would be the case without student attrition.

Of course some withdrawal cannot be avoided, some should not be. But Hampshire has too much. The national average for any kind of "dropout" or "stopout"--those not completing a bachelor's degree within four years of matriculation--is 40%. However, this national average combines the experience of community colleges with attrition rates of over 80% with that of elite liberal arts colleges with attrition rates of under 10%.

These national studies have found that a major cause of attrition is the lack of fit between a student's developmental schedule and that assumed by the four-year program of most colleges (Cope & Hannah, 1975; Hirsch & Kenniston, 1970; Shulman, 1976; Timmons, 1975). Yet Hampshire's lack of a rigid freshperson-senior sequence and our flexible, encouraged leave policy should avoid this cause of withdrawal.

What are the causes of our students' withdrawals? What are these students now doing? How do they now view their experience at Hampshire? How do they now evaluate their decision to withdraw from Hampshire? These and related questions were investigated in a telephone survey of a sample of our withdrawals.*

Method

Four hundred and seven students withdrew from Hampshire during the two academic years 1973 to 1975. From this group of 407, a random sample of 100 students was drawn. Some analyses using the College's Academic History data base used this 100 person sample. Half of the hundred person sample was also involved in the telephone survey. Using the telephone number or address last known by the College for the student or his/her parents, we were able to talk with 62% of our telephone sample (31 students). Interviews were conducted during March and April 1976 and averaged 25 minutes; they ranged from 11 to 35 minutes. We were able to contact the families of 6 students, but unable to reach these students themselves. Some had no telephones, some were overseas, some could not be contacted after several weeks' attempts at various hours on differing days. For 26% of our sample of 50 we were unable to contact the student or the family. No student contacted refused to be interviewed. Compared with other studies of attrition, with other attempts to contact people one or two years after they leave an organization, or with other survey research projects, our response rate was very good. Our group of 31 interviewed students is representative of the entire random sample of 100 students in terms of (a) the number of terms actively enrolled at Hampshire, (b) the number of Divisional examinations completed, (c) the number of Five College courses taken, (d) leave taking, and (3) percent men.

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*David Reuman conducted the telephone interviews and assisted in drafting the internal report on which this paper is based. This research was partially supported by a research subcontract from Empire State College, which in turn received a grant, entitled "Developing cost/effectiveness models for post-secondary education," from the Fund for the Improvement of Post-Secondary Education.

The telephone interview schedule was developed, revised in consultation with several groups on campus, and pilot tested on students who had withdrawn but were not in the sample of 50 to be interviewed for the formal study.

Initial Results

Although Hampshire's withdrawal rate has been a fairly steady 40% per annual entering class, few of these are "dropouts" from higher education; 85% of them have obtained or plan to obtain a bachelor's degree.

Three major factors were reported by students as contributing to their decision to withdraw (see Table 1). First, sixty percent cited problems with educational direction or resources. These included a personal lack of motivation (20%), the student's specialized interests thought better pursued elsewhere (20%), a lack of facilities, advising, good courses, or access to faculty (18%), or the insufficiency of Hampshire's radical alternativeness (2%). Second, twenty percent cited Hampshire's social atmosphere, with equal proportions describing the alienation, isolation and lack of community support, and describing the homogeneity of students. Third, fifteen percent cited cost considerations: feeling Hampshire was no longer worth that much money or having a financial aid reduction (cf. Demos, 1968; also see Dresch, 1975, on how the poor national economy lowers the full cost of college). Six percent had family or medical problems.

Students tended to involve their family, adviser, and friends in their decision to withdraw, but did not involve their House Staff, the Financial Aid Office, or the Health Service. Those involved tended to support the withdrawal decision.

Most students said there was nothing Hampshire could have done to change their decision to withdraw. Most thought their decision to leave Hampshire was a good one, and that their decision to come to Hampshire was also a good one. Reporting retrospectively, only 22% of the students said they were satisfied with their Hampshire experience when enrolled. In contrast, Cycles surveys over the past several terms have found general student satisfaction with the Hampshire experience to be 80%.[2] As expected, dissatisfaction may be a good predictor of intention to withdraw; our prior studies of contributors toward satisfaction underscore the importance of satisfaction with academic progress and not feeling isolated.

For some students who withdraw, the experience of Hampshire is a useful and necessary stage in their further growth and education. Some students initially misperceive the fit between themselves and the College; catalogs and admissions processes should be studied to try to minimize the likelihood of such misperception. Finally, some students withdraw who could benefit from continuing at the College. Attention to faculty work responsibilities and to course and advising quality could help retain some students who withdraw for academic reasons. Attention to problems of student isolation would not only also retain some students but would improve the quality of life for many students who do not withdraw.

Secondary Study

After our initial analysis of withdrawals from the College, we were able to use the data of that study in combination with prior studies of the quality of student life at the College in order to answer a question addressed to us as part of our study of Program Effectiveness and Related Costs. That question was:

> What is the cost to the College of inadequate or inaccessible advising and lack of "community" support mechanisms; what are the costs of isolation?

Based on several studies conducted during the past few years, we were able to give an approximate answer. The College loses over $100,000 per year due to our isolating social environment.

This hundred-thousand dollar per year figure primarily derives from our study of students who had withdrawn from Hampshire. Table 2 indicates the major reasons for withdrawal, and apportions them among academic, social, and exogenous factors. For example, two-thirds of the problem with specialized interests is attributed in this analysis to academic factors which could be improved, such as better courses or advising, while one-third is attributed to exogenous factors the College cannot control. Likewise, two-thirds of the problem with alienation is attributed in this analysis to social factors the College could improve, while one-third is attributed to exogenous factors the College cannot control. These attributions of causality are rough assumptions, but they are reasonable and serve to yield an initial rough estimate of the cost of deficient academic or social programs at the College.

While the attribution of various reasons for withdrawal to a proportionate social factor is relatively straightforward, the centrality of student isolation needs additional comment. It is assumed that if withdrawn students had been more interconnected with other students excitedly engaged in intellectual pursuits, then the withdrawal-prone students may have been more likely to find an academic path of interest, and thus lack of personal motivation would be less of a reason for withdrawal. Homogeneity of students, as used by our students, primarily reflects their feeling of being outside the dominant group and their lack of any positive group of other students with which to identify and interact. Cost is generally associated with a "not worth that much" feeling. A withdrawal-prone student would be more likely to remain actively enrolled if s/he felt more identification with and reward from the College.

By this analysis of reasons for withdrawing from Hampshire, it is found that 25% of our withdrawals or 50 students per year leave due to social factors. At $2045 tuition per term, this amounts to $102,250 per year lost to the College. Much of this cost may be considered a true cost to the College, since we have been unable to maintain our desired enrollment of 1300 students.

Additional student enrollment to the desired 1300 would somewhat decrease the proportionate cost of fixed, administrative, and other overhead expenses. Much more importantly, however, if we had a lower withdrawal rate Admissions would be under less pressure to find sufficient qualified applicants and the College would be able to enjoy less uncertainty in enrollment projections for future budgeting. As discussed in another Hampshire report (Kegan, 1976), the uncertainty of a series of one-year soft-money faculty appointments in the amount currently borne by the College has severe dysfunctions for the College, for the students, and for the faculty.

There are additional costs of Hampshire's isolation and lack of community support mechanisms. The College loses room rent from students living off-campus when the Houses are not fully utilized. A February 1976 survey found that a quarter of the students would want to live off-campus if there were no residence requirement. Since there is both a residence requirement and a somewhat restricted close off-campus housing market, the College does not have as many unpaid rooms as it might under freer market conditions. This very restriction, however, must increase the frustration of some on-campus students.

Not feeling isolated is an important contributor toward satisfaction with one's Hampshire experience (Kegan, 1975), and this withdrawal study found that students who withdraw are much less satisfied with their Hampshire experience than students who remain.

Altogether then, there are substantial financial, psychological, and educational costs to our current isolating social atmosphere. There are thus substantial financial, psychological, and educational benefits that could occur if the College worked to decrease its isolating atmosphere. Such is possible.

Our rate of felt isolation is not immutably connected with the American college experience. In April 1975 parallel Cycles surveys were conducted at Hampshire College, Amherst College, and the University of Massachusetts (Kegan, Benedict, & Grose). At Amherst and at UMass 40% of the participating students reported that they felt isolated from most of the people at their college. At Hampshire, the reported sense was half again as much, 60%.

Our academic program and the personal dispositions of our students contribute to their individual freedom and also to their isolation. However, it is possible to develop support systems to balance these isolating factors.

Conclusion

There are several implications of this study for institutional researchers at other institutions. Methodologically, this was an inexpensive study: interviewer and telephone costs were less than $350. Symbolically, this was a study with major impact. The study provided an opportunity for correcting campus misperceptions of our attrition rate and focusing attention on the problem. Administratively, a formal retention program was instituted to try to reduce our attrition rate. This several-faceted program involves greater contact with students while on leave, more active monitoring of and discussions with potential withdrawals, more active monitoring of students' academic progress, the establishment of new student support groups convened by faculty or staff, and a general campus-wide (administrative and faculty) heightened awareness of our attrition problem.

Politically, the implications of the study and its recommendations are still being worked out. Conflicting images of the College's proper and possible role will influence the depth to which corrective action may be taken. A principal issue is the extent to which fundamental contradictions in the design and operation of the College or more surface procedural issues will be addressed.

TABLE 1. Stated Reasons Contributing to Withdrawal

	Reasons Reported	Weighted Reports*	Weighted Percent*
Lack of motivation	10	6.0	19%
Specialized interest	11	6.3	20%
Lack of facilities or guidance	10	4.6	15%
HC not sufficiently alternative	3	1.5	5%
Direction and Resources	34	18.1	59%
Alienation, isolation	8	2.9	9%
Student Homogeneity	8	2.6	8%
Residence requirement	1	0.3	1%
Social Atmosphere	17	5.8	19%
Not worth that much	7	3.4	11%
Financial aid cut	2	0.8	3%
Cost	9	4.2	14%
Family/Medical Problems	2	2.0	6%
Emotional Problems	2	0.7	2%
	4	2.7	9%
TOTALS	64	30.8	99%

* Weighted so that each interviewee's reasons sum to 1.

TABLE 2

Reasons for Withdrawal Allocated Among
Academic, Social, or Exogenous Factors

Reasons for Withdrawal		Allocations to Assumed Causal Factors		
		Academic	Social	Exogenous
Lack of personal motivation	20%	1/3	1/3	1/3
Specialized interests	20%	2/3	0/3	1/3
Lack of facilities	20%	2/3	0/3	1/3
Alienation	10%	0/3	2/3	1/3
Homogeneity of students	10%	0/3	2/3	1/3
Cost	15%	1/3	1/3	1/3
Family/Medical	6%	0/3	0/3	3/3
TOTALS	101%	38%	25%	38%

FIGURE 1.

Withdrawal Phone Survey

HAMPSHIRE COLLEGE
AMHERST, MASSACHUSETTS 01002

Office of Institutional Research and Evaluation

Start time:

Hello. I'm ____________________ from Hampshire College and I'm helping the student/faculty Admissions Committee here survey a small sample of students who withdrew from Hampshire College. I have a few questions to ask which will take about 10 minutes. Is this a good time; /pause/

if not, when: Day & Date & Time ____________________ Phn ______________

Your answers will be held strictly confidential; that is, your name will not be identified with any of your answers. Your responses will simply be tallied with those of other alumni. We would like your answers to be as open and frank as possible. Because this is a long-distance phone interview, please answer briefly.

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1. Could you tell me what your major current activity is? /pause, if necessary/ school, work, something else? /probe for specifics, eg Berkeley junior in psychology, bagel baker/
2. How long have you been doing this?
3. What did you do during the first semester after you left Hampshire?
4. /Only if needed/ What were you doing between then and now?
5. You requested _n_ transcripts from Central Records for ____________; did you complete each application and where were you accepted?

As I mentioned, I'm doing this study to help learn about students' decisions to withdraw from Hampshire.

6. What factors contributed to your decision to withdraw?
7. /If no Hampshire factors mentioned/ How did your Hampshire experience contribute to your decision to withdraw?
8. /Only if needed/ Did you have control over your decision to withdraw; could you have stayed if you wanted to?
9. Could you list the names of the people you talked with about withdrawing, from the time you first thought of it through your formal withdrawal. Include both Hampshire and non-Hampshire people. /CHECK THOSE MENTIONED, AND OMIT FROM QUESTION 11/
10. What was the reaction of those people to your withdrawing?

11. I'm going to read a short list of people students sometimes consult before withdrawing. For each person, would you tell me first, whether you thought of talking with them about withdrawing, and second, if you had thought of it, why you decided not to consult with them.
/CHECK THOUGHT Y OR NO, AND LIST REASON/

your adviser
your house staff /which role/
the office of the dean of the college, Ken Hoffman or Courtney Gordon
financial aid office, John Taylor
the health service
your parents

12. Was there anything Hampshire could have done to change your decision to withdraw?

13. Do you now feel your decision to leave Hampshire was a good one?

14. Do you think your decision to come to Hampshire was a good one?

15. Was any of your initial information about Hampshire unreliable? What? /explicit information and source/

16. In a word or phrase, what effect do you feel your Hampshire experience had on you?

17. What do you think you'll be doing over the next few years? /probe to get feel of expected career/life-style/

18. How satisfied are you with your current major activities; would you say you are: very dissatisfied, dissatisfied, neutral, satisfied, or very satisfied?

19. In retrospect, when you were at Hampshire, how satisfied did you feel with your Hampshire experience? /use above categories-phrases/

20. From your present perspective, how satisfied are you with your Hampshire experience? /use above phrases/

That's all the questions I have now. /pause/
If you'd like, we can send you a summary of this study. Would you like to receive one? N Y
/If yes/ Do I have your address correct: ______________________________

Finish time:

REFERENCES

Cope, Robert G. & William Hannah. Revolving College Doors: The Causes and Consequences of Dropping Out, Stopping Out, and Transferring. New York: Wiley, 1975.

Demos, George, D. Analysis of College Dropouts--Some Manifest and Covert Reasons. Personnel & Guidance Journal, 46, 681-684, March, 1968.

Dresch, Stephen. A Curmudgeon's View of the Future of Academe. Coping in the 70's: Papers from the Second Annual Meeting of the North East Association for Institutional Research, November, 1975.

Hirsch, Steven J. & Kenneth Keniston. Psychosocial Issues in Talented College Dropouts. Psychiatry, 33, 1-20, 1970.

Kegan, Daniel L. The Augmented End-of-Year Cycles Survey, April, 1975. Report #W31. Amherst, Ma: Office of Institutional Research and Evaluation, Hampshire College, July, 1975.

Kegan, Daniel L. Some Policy Recommendations from Institutional Research. Report #W61. Amherst, Ma: Office of Institutional Research and Evaluation, Hampshire College, August, 1976.

Kegan, Daniel L., Larry Benedict, & Robert Grose. Developing and Using Quality of Student Life Indicators: The Cycles Surveys at Hampshire College, Amherst College, and the University of Massachusetts, April, 1975. Coping in the 70's: Papers from the Second Annual Meeting of the North East Association for Institutional Research, November, 1975.

Shulman, Carol H. Recent Trends in Student Retention. AAHE College and University Bulletin, 28, 9, May, 1976.

Timmons, Frank R. Research on College Dropouts. In Bernard L. Bloom (Ed.) Psychological Stress in the Campus Community. New York: Behavioral Publications, 1975.

FOOTNOTES

[1] The sole measure of a student's academic good standing at Hampshire is his/her progress on six Divisional examinations--student initiated and designed learning contracts which are approved by a faculty member. A student begins in Division I (which consists of four distribution exams) and graduates from Division III. Hampshire participates with Amherst College, Mount Holyoke College, Smith College, and the University of Massachusetts in a Five College Consortium. Students at any of these five colleges located in the Connecticut River Valley may relatively easily register for and attend classes offered by any of the five colleges.

[2] Cycles surveys are fifty-item questionnaires periodically used to monitor the quality of student life. These indicators, developed at Hampshire, provide a low cost longitudinal research and evaluation program and permit data comparisons with other institutions.

STATISTICAL DECISION-MAKING AND PRACTICAL REALITIES: THE EFFICACY OF PREDICTING PROGRESS IN COLLEGE FROM HIGH SCHOOL ACHIEVEMENT

Susan Loveland and Barry Kaufman
CUNY

The prediction of academic progress and achievement in college has been and remains a topic of considerable study by college admissions personnel and researchers. The investigation of the relationships between the various measures of achievement at the high school and college levels is of theoretical interest, whereas the feasability of assessing a student's probable degree of success in college prior to his admission is of practical interest. However, the evaluation of the regressions in predictive studies is often complicated by such factors as: (1) the choice of the criterion variable, which is frequently limited to freshman year cumulative grade point average and/or second semester retention, rendering problematic the longitudinal validity of the regression equation; (2) unknown attenuation of correlation, due to the study's being limited to only those students whom the institution selectively admitted from the more heterogeneous pool of applicants; (3) the lack of information on those students missing data, calling into question the representativeness of the regression sample and (4) the difficulty in interpreting the practical usefulness of the prediction equations, since the closeness of fit is usually expressed as the proportion of accountable variance.

The present study examines the predictability of performance of 1970 and 1971 senior college freshmen at the City University of New York four years after their initial enrollment.

More specifically, the study analyzes the relationship of pre-college academic achievement to college performance by: (1) comparing applicants to enrollees with respect to the distributions of the pre-college variables; (2) examining the distribution of the criterion variable in both the total enrollee population and the population for which complete data were available; (3) regressing the criterion variable on the pre-college entry variables; (4) cross-validating the prediction equations; and (5) assessing the practical significance of the regression analysis through cross-tabular tables.

Pre-college entry variables consist of: the total number of academic units (TOTU) completed as of the end of the junior year (11th grade) in high school; the grade average (CAA) based on these academic courses; the corresponding percentile rank (HS%) of the student in his class; and the student's raw score on a standardized reading test (OATR), administered in the spring preceding the fall admissions. Due to the availability of longitudinal data, all college performance variables are measures taken four years after initial admission and consist of: cumulative grade point average (CGPA); cumulative credits earned (CCE); and enrollment or graduation status.

Since graduation is the successful outcome of the college experience from an admissions point of view, students were categorized as to their progress towards graduation, thus defining the criterion variable (RTNSC8). Accordingly, students who had graduated received the highest score, those enrolled in the eighth semester with at least lower senior status (based on cumulative credits earned) and a cumulative grade point average of at least 2.0 received the next highest score, those enrolled with less than lower senior status or less than a 2.0 cumulative grade point average received the third highest score, and those not enrolled whatsoever received the lowest score.

It should be noted that the 1970 and 1971 freshmen entered the City University under an open admissions policy in which all diploma graduates of New York City high schools were guaranteed admission, regardless of their high school average. This provides the study with a fairly heterogeneous pool of enrollees. Thus, most attenuation of correlation is due to the self-selection of the applicants, rather than selective admission on the part of the institution.

Table 1 provides distributions of CAA, HS%, and TOTU for the 1970 and 1971 applicant and enrollee populations. Note that OATR was not available for the applicants. It can be seen that the two populations of enrollees were more homogeneous than that of applicants with respect to CAA, although the medians and standard deviations do not differ radically from a practical point of view. With respect to HS% the enrollees, as a group, were of slightly higher caliber. All populations were essentially identical with respect to TOTU.

Since it was known that of the four independent variables (the pre-college entry measures) HS% and OATR were the most likely to be missing, Table 2 was prepared to indicate to what extent three important populations differ with respect to the distribution of RTNSC8. It can thus be seen that the requirement of complete data on CAA, TOTU, HS%, and OATR produces a population which is relatively more "successful" than the population of all enrollees. However, the exclusion of only those cases missing CAA and/or TOTU does not affect the distribution of the dependent variables.

Linear, step-wise, free-entry multiple regressions were then run. RTNSC8 was first regressed on CAA, TOTU, HS%, and OATR for both the 1970 and 1971 freshman cohorts, yielding R^2's of about .128 and .125, respectively. For cross-validation purposes, the regression equation derived from the 1970 freshmen was applied to the 1971 freshmen and the resulting predicted RTNSC8 was correlated with its actual value. This resulted in a correlation coefficient of .35245 which compares favorably with the multiple regression correlation coefficient of .35335 obtained from the regression run on the 1971 data and is the maximal R possible from the 1971 data.

Since HS% and OATR were entered into the equations last, contributing very little additional accountable variance, and, since these data were missing for roughly a third of the freshmen, linear, step-wise, free-entry multiple regressions were then run on CAA and TOTU only, resulting in R^2's of about .127 and .119 for 1970 and 1971 cohorts, respectively. Similarly, for cross-validation purposes, the correlation of actual 1971 cohort "success" scores with the scores predicted from the 1970 derived equation yielded an R of .34363 which also compares quite favorably with a 1971 multiple R of .34431.

Two interesting outcomes of the regression analysis are illustrated below in which the four pre-college entry variables along with CGPA, CCE, and the product of CAA with HS% (CAAXHS%) are correlated with RTNSC8.

Correlation Coefficients: Independent Variables with RTNSC8

	CGPA	CCE	CAA	OATR	HS%	CAAXHS%	TOTU
1970 RTNSC8	.59	.86	.34	.22	.24	.27	.29
1971 RTNSC8	.57	.85	.34	.24	.24	.27	.28

Firstly, since CCE correlates much higher than CGPA with the criterion variable, the tentative implication is that predictive studies unable to obtain graduation data should perhaps consider the validity of using credit accumulation measures as criterion variables, rather than the more commonly used cumulative GPA.

Secondly, it appears that high school averages, even unweighted by rank in class, are better measures of college success than high school rank alone and at least this particular standardized test. Perhaps it is because one's grade average includes non-cognitive components of academic success, such as, persistence and other related motivations, whereas a standardized test is a "one-shot" cognitive measure, that the unweighted CAA was the more important variable.

Lastly, to evaluate the practical usefulness of the obtained regression equations, especially in these cases where relatively low R^2's, were obtained, the predicted scores, using the 1970 regression equations, were cross-tabulated against the actual scores (see Tables 3-6) for both the 1970 and 1971 cohorts. To facilitate the cross-tabular analysis, the predicted "success" scores were first linearly transformed to maximize score spread and then collapsed into five categories, each containing roughly 20% of the cases.

It can be seen that all cross-tabulations yield roughly the same percentage distributions across rows and columns. Due to the high percentage of "unsuccessful" freshmen and to the low R^2's, a large number of students with low criterion scores are instead predicted as being "successful" and barely over one half of the "unsuccessful" students received the lowest 40% of scores. On the other hand, approximately two thirds of the graduates received predicted scores in the upper 40% of the range. Thus, these regression equations appear to be less effective at identifying unsuccessful cases, but reasonably effective at predicting successful cases. It is suggested that the cross-tabulations represent an important supplement for evaluating the usefulness of the regression analysis, since the derived equations may be differentially effective along the range of predicted scores.

In conclusion, this study of prediction of college success from so-called "admission variables" involved large numbers of students with relatively minimal attenuation of correlation. The dependent variable, instead of being the more common criterion of cumulative grade point average, was a composite measure, based on progress towards graduation. The regression selection procedure favored unweighted high school grade averages over more standardized achievement variables, with potentially important implications for admissions personnel. The effect of missing data upon the distribution of the criterion variable was explored. Lastly, through cross-tabular analysis the practical usefulness for decision making purposes of a relatively low R^2 is illustrated.

Table 1: Distributions on Independent Variables for 1970 and 1971 Senior College Applicants and Enrollees

	1970		1971	
	Applicants	Enrollees	Applicants	Enrollees
CAA				
<75	23.5%	22.1%	29.7%	22.1%
≥75<85	44.6%	50.4%	42.8%	50.3%
≥85	31.9%	27.5%	27.5%	27.6%
Mean	80.2	79.8	79.0	79.9
Median	80.6	80.3	79.2	80.2
S.D	7.7	7.1	8.0	7.0
N	34,121	18,980	39,702	18,558
% of Total	99.3%	96.0%	98.8%	97.5%
HS % & Rank				
<50	25.7%	19.5%	31.6%	22.5%
≥50<75	32.6%	39.5%	30.6%	38.1%
≥75	41.7%	41.0%	37.8%	39.4%
Mean	64.6	66.6	61.4	65.5
Median	68.8	69.3	65.2	68.4
S.D.	24.5	21.1	25.9	21.7
N	28,524	15,882	31,055	15,500
% of Total	83.1%	80.4%	77.2%	81.5%
HS Units				
Mean	13.7	13.7	13.3	13.4
Median	14.4	14.3	14.0	14.1
S.D.	2.4	2.4	2.6	2.5
N	34.128	18,025	39,685	18,167
% of Total	99.3	91.2%	98.7%	95.5%
TOTAL N	34,362	19.761	40,201	19,025

Table 2: Distributions of 1970 and 1971 Senior College Enrollee Populations on Eighth Semester Criterion Variable

1970	All Enrollees	Enrollees With CAA & TOTU	Enr[illegible] Co[illegible]
Not Enrolled	41.5%	40.1%	39.0%
Enrolled "Unsuccessfully"	19.0	18.5	17.6
Enrolled "Successfully"	17.3	18.2	19.3
Graduated	22.2	23.2	25.0
Total N	19,133*	17,526	12,870
1971			
Not Enrolled	43.8%	43.1%	39.9%
Enrolled "Unsuccessfully"	20.3	20.2	19.3
Enrolled "Successfully"	16.2	16.6	18.3
Graduated	19.8	20.1	22.4
Total N	18,340*	17,559	11,477

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*N's differ from those in Table 1 due to missing or incomputable GPA'

Table 3: Predicted Score (CAA, OATR, HS%, TOTU) by Actual Performance After Eight Semesters, 1970 SC Freshmen

PREDICTED SCORE
Lowest
↓
Highest

```
           PERFORMANCE
 COUNT   I
 ROW PCT I                                                   ROW
 COL PCT I NOT       ENROLLED   ENROLLED                     TOTAL
 TOT PCT I ENROLLED IUNSUCC.   I SUCC.    I  GRAD.    I
 --------I---------I---------I---------I---------I
      1  I  1309   I    596  I    193  I    139  I    2237
         I  58.5   I   26.6  I    8.6  I    6.2  I    17.4
         I  26.7   I   26.3  I    7.8  I    4.3  I
         I  10.2   I    4.6  I    1.5  I    1.1  I
        -I---------I---------I---------I---------I
      2  I  1204   I    569  I    437  I    374  I    2584
         I  46.6   I   22.0  I   16.9  I   14.5  I    20.1
         I  24.6   I   25.1  I   17.6  I   11.6  I
         I   9.4   I    4.4  I    3.4  I    2.9  I
        -I---------I---------I---------I---------I
      3  I   873   I    459  I    538  I    575  I    2445
         I  35.7   I   18.8  I   22.0  I   23.5  I    19.0
         I  17.8   I   20.2  I   21.6  I   17.9  I
         I   6.8   I    3.6  I    4.2  I    4.5  I
        -I---------I---------I---------I---------I
      4  I   853   I    423  I    724  I    921  I    2921
         I  29.2   I   14.5  I   24.8  I   31.5  I    22.7
         I  17.4   I   18.6  I   29.1  I   28.6  I
         I   6.6   I    3.3  I    5.6  I    7.2  I
        -I---------I---------I---------I---------I
      5  I   656   I    222  I    595  I   1210  I    2683
         I  24.5   I    8.3  I   22.2  I   45.1  I    20.8
         I  13.4   I    9.8  I   23.9  I   37.6  I
         I   5.1   I    1.7  I    4.6  I    9.4  I
        -I---------I---------I---------I---------I
 COLUMN     4895      2269      2487      3219       12870
  TOTAL     38.0      17.6      19.3      25.0       100.0
```

Table 4: Predicted Score (CAA and TOTU) by Actual Performance After Eight Semesters, 1970 SC Freshmen

PREDICTED SCORE
Lowest
↓
Highest

```
          I PERFORMANCE
 COUNT    I
 ROW PCT  I                                                  ROW
 COL PCT  I NOT      ENROLLED   ENROLLED                     TOTAL
 TOT PCT  I ENROLLED I UNSUCC.  I SUCC.    I  GRAD.    I
 ---------I---------I---------I---------I---------I
      1   I  1926   I    897  I    264  I    164  I    3251
          I  59.2   I   27.6  I    8.1  I    5.0  I    18.5
          I  27.4   I   27.6  I    8.3  I    4.0  I
          I  11.0   I    5.1  I    1.5  I    0.9  I
         -I---------I---------I---------I---------I
      2   I  1661   I    810  I    508  I    475  I    3454
          I  48.1   I   23.5  I   14.7  I   13.8  I    19.7
          I  23.7   I   24.9  I   16.0  I   11.7  I
          I   9.5   I    4.6  I    2.9  I    2.7  I
         -I---------I---------I---------I---------I
      3   I  1323   I    663  I    690  I    720  I    3396
          I  39.0   I   19.5  I   20.3  I   21.2  I    19.4
          I  18.8   I   20.4  I   21.7  I   17.7  I
          I   7.5   I    3.8  I    3.9  I    4.1  I
         -I---------I---------I---------I---------I
      4   I  1263   I    584  I    991  I   1237  I    4075
          I  31.0   I   14.3  I   24.3  I   30.4  I    23.3
          I  18.0   I   18.0  I   31.1  I   30.4  I
          I   7.2   I    3.3  I    5.7  I    7.1  I
         -I---------I---------I---------I---------I
      5   I   848   I    296  I    729  I   1477  I    3350
          I  25.3   I    8.8  I   21.8  I   44.1  I    19.1
          I  12.1   I    9.1  I   22.9  I   36.3  I
          I   4.8   I    1.7  I    4.2  I    8.4  I
         -I---------I---------I---------I---------I
 COLUMN      7021      3250      3182      4073       17526
  TOTAL      40.1      18.5      18.2      23.2       100.0
```

Table 5: Predicted Score (CAA, OATR, HS%, TOTU) by Actual Performance After Eight Semesters, 1971 SC Freshmen

PREDICTED SCORE	COUNT ROW PCT COL PCT TOT PCT	PERFORMANCE NOT ENROLLED	ENROLLED UNSUCC.	ENROLLED SUCC.	GRAD.	ROW TOTAL
Lowest	1	1290	604	216	120	2230
		57.8	27.1	9.7	5.4	19.4
		28.2	27.2	10.3	4.7	
		11.2	5.3	1.9	1.0	
	2	1146	594	398	280	2418
		47.4	24.6	16.5	11.6	21.1
		25.0	26.8	18.9	10.9	
		10.0	5.2	3.5	2.4	
	3	781	424	444	409	2058
		37.9	20.6	21.6	19.9	17.9
		17.0	19.1	21.1	15.9	
		6.8	3.7	3.9	3.6	
	4	601	398	615	863	2677
		29.9	14.9	23.0	32.2	23.3
		17.5	18.0	29.2	33.5	
		7.0	3.5	5.4	7.5	
Highest	5	563	197	433	901	2094
		26.9	9.4	20.7	43.0	18.2
		12.3	8.9	20.6	35.0	
		4.9	1.7	3.8	7.9	
	COLUMN TOTAL	4581	2217	2106	2573	11477
		39.9	19.3	18.3	22.4	100.0

Table 6: Predicted Score (CAA and TOTU) by Actual Performance After Eight Semesters, 1971 SC Freshmen

PREDICTED SCORE	COUNT ROW PCT COL PCT TOT PCT	PERFORMANCE NOT ENROLLED	ENROLLED UNSUCC.	ENROLLED SUCC.	GRAD.	ROW TOTAL
Lowest	1	2141	981	259	161	3542
		60.4	27.7	7.3	4.5	20.2
		28.3	27.7	8.9	4.6	
		12.2	5.6	1.5	0.9	
	2	1814	905	535	360	3614
		50.2	25.0	14.8	10.0	20.6
		23.9	25.6	18.4	10.2	
		10.3	5.2	3.0	2.1	
	3	1334	678	640	590	3242
		41.1	20.9	19.7	18.2	18.5
		17.6	19.2	22.0	16.7	
		7.6	3.9	3.6	3.4	
	4	1381	651	861	1181	4074
		33.9	16.0	21.1	29.0	23.2
		18.2	18.4	29.6	33.4	
		7.9	3.7	4.9	6.7	
Highest	5	905	325	616	1241	3087
		29.3	10.5	20.0	40.2	17.6
		11.9	9.2	21.2	35.1	
		5.2	1.9	3.5	7.1	
	COLUMN TOTAL	7575	3540	2911	3533	17559
		43.1	20.2	16.6	20.1	100.0

IMPLICATIONS OF TWO STATEWIDE FOLLOW-UP STUDIES FOR PLANNING AND EVALUATION

James D. Tschechtelin
Maryland State Board for Community Colleges

This report draws implications for planning and evaluation from two Statewide Student Follow-Up Studies, joint projects of the State Board for Community Colleges and the Maryland Community College Research Group. The full reports are available from the State Board office. The central problem was that Maryland community colleges and the State Board for Community Colleges had insufficient information about the outcomes of the community college education, information necessary to improve the quality of education. The primary purpose of the study was to help Maryland community colleges evaluate the extent to which they are assisting students in achieving their educational goals, their immediate career development, and their preparation for transfer to senior colleges and universities.

Specific research questions were directed toward five areas: student educational goals, goal achievement, career development, transfer, and satisfaction with college. In 1975 and 1976, questionnaires were sent to all persons who were first-time students in a Maryland community college in Fall 1971 and 1972, respectively. The results from both studies were quite similar, and the most recent data will be reported in this paper. The response rate among those receiving the questionnaires was 48 percent. A sequential sampling procedure was used to test for nonrespondent bias, and significant differences were found between respondents and nonrespondents. In general, the respondents were more academically successful and more likely to have transferred.

Student Educational Goals

Colleges should consider assessing student educational goals at each registration. There are two variables to be assessed: the first is the

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The follow-up studies were conducted with the excellent assistance of coordinators from Maryland community colleges: Roger Anderson, Richard Behrendt, Allan Bickling, Susan Bravman, William Campbell, Robert Gell, Marc Goldstein, Jan Janssen, Mary Johnson, Matthew Kelly, Tom LaBonte, Paul Larkin, Toby Milton, Cheryl Opacinch, Charlene Wenckowski, and Paul Yorkis.

student's degree aspiration and the second is the student's personal goal, such as immediate career development or transfer. The follow-up studies have shown that programs are not a valid indicator of educational goals. For example, many students in career programs aspire to transfer (Table 1).

Table 1

Educational Goals of Respondents by Program Type

Program Type	Educational Goal: Transfer	Career Development	Courses of Interest
Transfer	72%	17%	11%
Career	36	57	7
Special Student	30	36	34

Without an assessment of student goals, nothing is known about the growing number of students who do not declare a program and are classified as special students. In Fall 1975, 21 percent of all Maryland community college students were in this category.

Since the follow-up studies also showed that students often change their educational goals, it would be insufficient to assess goals only upon entry to the college or even once a year. In order to understand and be responsive to student educational needs, goals should be assessed at every registration. Figures 1, 2, and 3 illustrate the changing goals of students. The reduction between column 4 and column 5 reflects goal changes in each figure. In all, nearly one in five said they changed their educational goal since entering the community college.

Definition of Student Success

A new effort must be made to inform educators and citizens about what constitutes success in a community college. The follow-up studies not only found that half of the incoming students did not want an AA degree (Figure 1), but that nongraduates get jobs, receive increases in salary, and even recommend their experience to their friends. Figure 1 shows that only 21 percent of all respondents had received the AA degree within three and one-half years. However, column 6 on the same figure shows that among those with an AA goal, 45 percent earned the AA degree. While 55 percent were employed full-time, 74 percent were employed full-time when their goal was career development (Figure 2). While only 38 percent transferred, 68 percent transferred when their goal was transfer (Figure 3). The common definition of the term "drop-out" and its connotation of failure must be changed. The program proposal manuals and the program monitoring systems should be revised to describe success in the context of student goals and in terms of criteria, such as educational goal achievement and employment of nongraduates.

Concept of a Program in the Community College

The traditional concept of a program in community colleges should be reconsidered. An increasing number of students are enrolling as special students, declining to make a commitment to any particular program. The follow-up studies have shown that only a minority of students complete an academic program (Figure 1) and that special students rate their educational experiences as highly as students who were enrolled in a specific transfer or career program (Table 2). In short, fewer students are using the traditional program structure and they are finding sucess as special students. It is suggested that governing boards and appropriate faculty committees review the traditional definition of a program and consider alternate ways to plan, structure, implement, and evaluate educational experiences.

Table 2

Satisfaction with Program by Program Type

	"Would you recommend your program of study to a friend?"		
Program Type	Yes	No	Uncertain
Transfer	79%	9%	12%
Career	79	10	11
Special Student	79	7	14

Career and Personal Adjustment

It is suggested that further research be conducted on the massive adjustments that apparently take place between the students' initial goals and what they ultimately do after leaving the community college. For example, the follow-up studies showed that a considerable proportion of students entered a community college aspiring to an associate degree and transfer to another college. In reality, few students transferred and even fewer achieved the AA degree. Compare columns 2, 3, and 4 among Figures 1, 2, and 3. Degree achievement and transfer are clearly "underachieved," while employment is clearly "overachieved."

Further research could explore whether this career and personal adjustment is real or imposed. A "real" adjustment is defined as a genuine reconciliation of personal attitudes and abilities with the demands of the world of work. While often painful, real adjustment is positive. To the extent that the student's adjustment is real, the research could investigate the ways in which community colleges are helping or hindering this process. An adjustment can be defined as "imposed" if the disparity between initial goals and actual outcomes is imposed upon students from causes beyond their control. For example, do persons become turned off by the academic life and change their goals because of a frustration with classroom or college experience? Further research would help to determine if the student adjustment process is real or imposed and suggest ways to deal with it.

Figure 1

Degree Aspirations and Achievement among Respondents

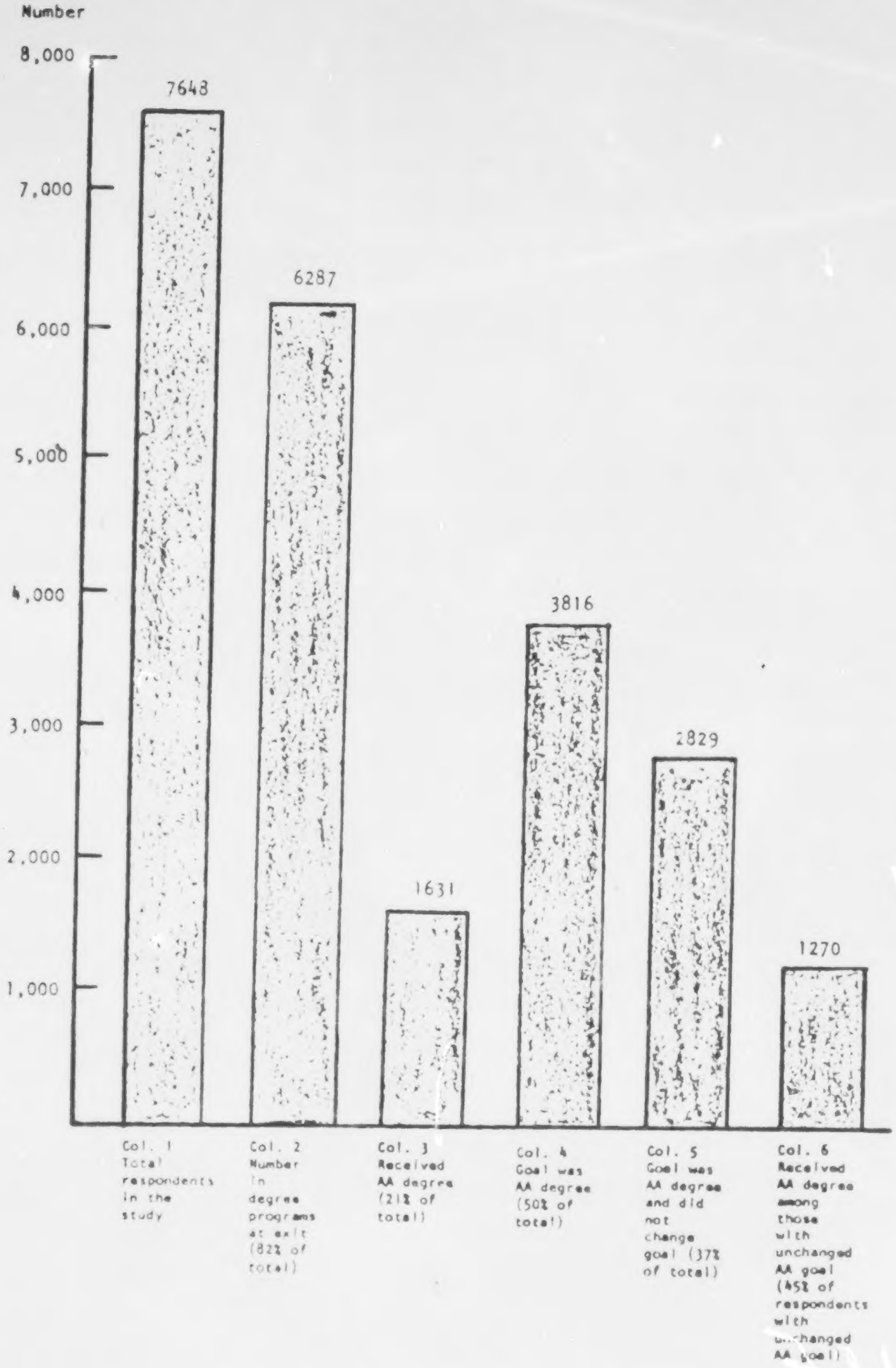
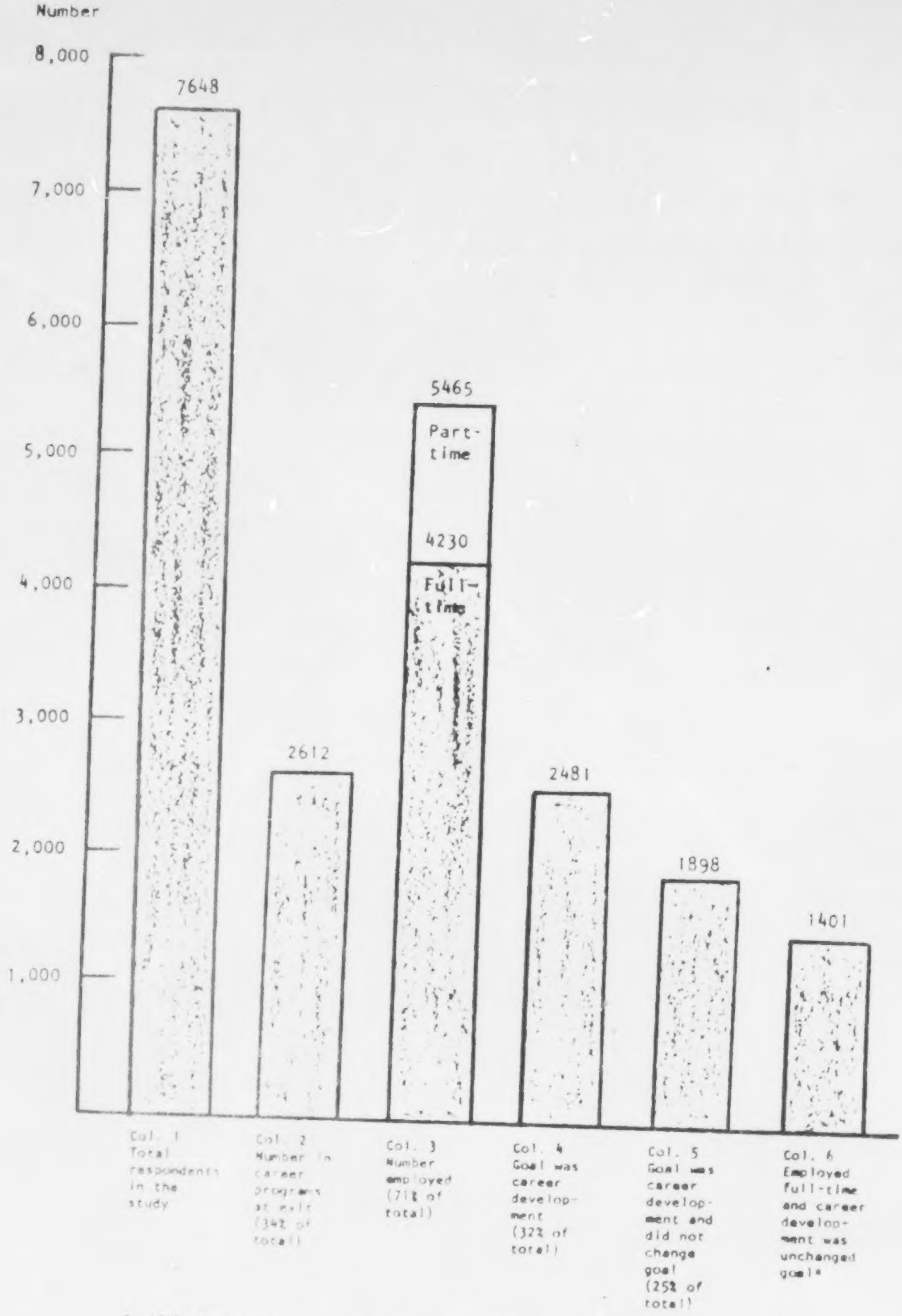


Figure 2

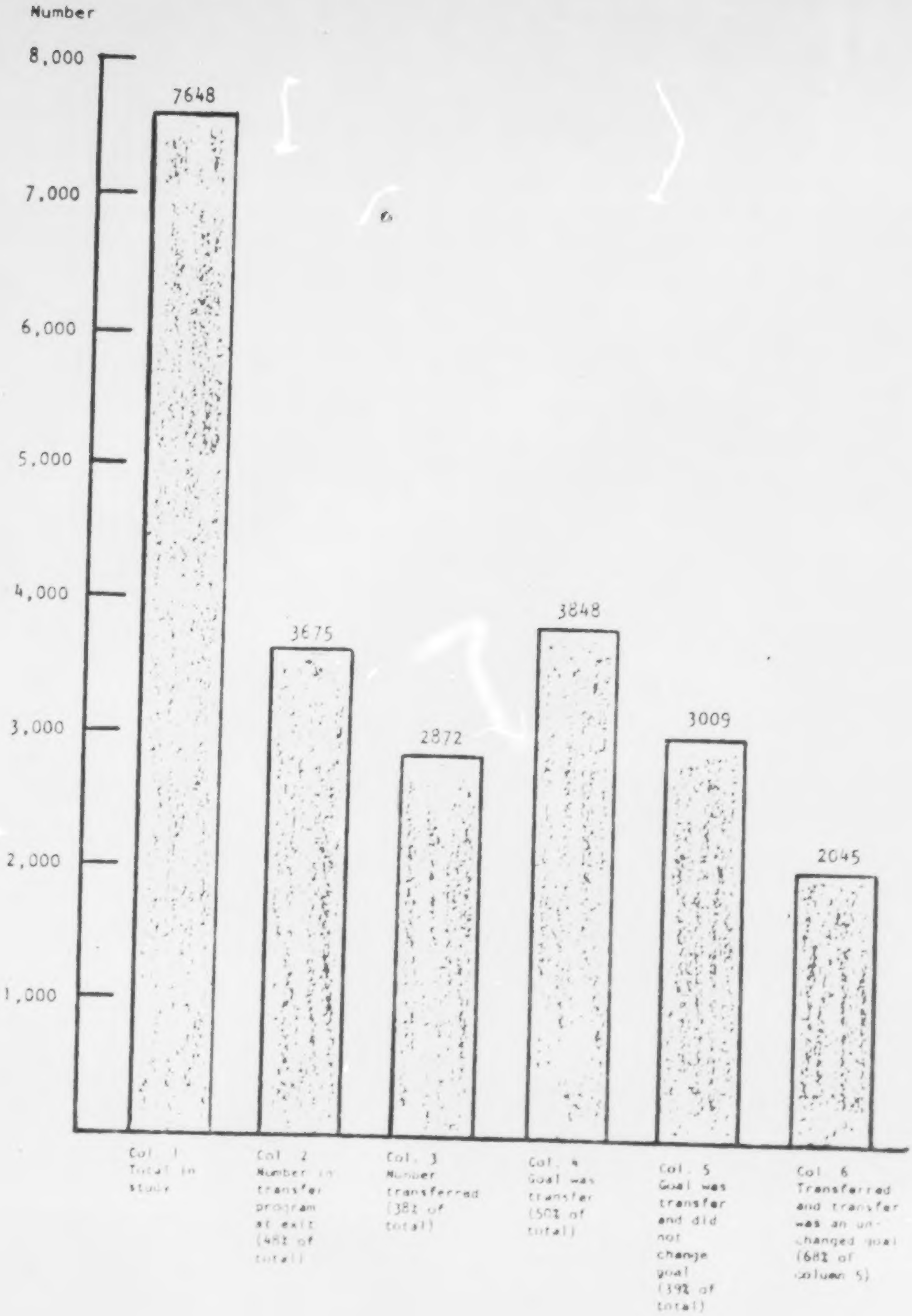
Career Development Aspirations and Achievement among Respondents



* (74% of respondents with unchanged career development goal)

Figure 3

Transfer Aspirations and Achievement among Respondents



THE DEVELOPMENT OF AN ACADEMIC PLAN
POLITICAL REALITY AND RATIONALISM
A CASE HISTORY: SUNYAB

A. H. Kuntz
SUNY at Buffalo

Background

A University is a collection of heretical minds gathered at a common physical site. It is usually divided into students, faculty, administrators, operational staff and others. The most heretical minds of all seem housed in the maintenance staff.

Political Reality

Administrators appear to be figures of authority. Faculty seem to practice highly individualized professions, sometimes unique unto themselves. Students are of an age where it seems natural to reject authority and everything else outside their culture. Faculty and students appear to believe that any authority except their own is restrictive and often are contemptously hostile to any authority at all. Students question the legitimacy of both faculty and administrative authority, as well as ancestry, from time to time. The location of authority to respond to and to resolve major university problems, as well as student grievances, is very confused. It is not clear whether faculty or administrators are to maintain law and order, to teach and to administer, or to protect life and property. Faculty maintain, in the Columbia tradition, that they _are_ the university; _they_ formulate educational policy, _they_ govern the university. For a brief review of statements concerning faculty, students, administrations and university governance, please see the publication of John Millet, _Strengthening Community in Higher Education_.

Some Rationalism

Specific to this paper, the State University of New York at Buffalo is a large urban university, one unit of a fairly large university system. The context of the social forces at work in the early years of this decade is well known to all of you. Those forces were at work at SUNY Buffalo. Tear gas on Main Street was not unknown to many of us.

University responses to the social pressures at work in the early seventies were many and varied. Some universities changed presidents, some established task forces on university goals, on academic reform, on governance, on special programs. Some put faculty senates to work on educational policy and planning. At least one produced three abortive attempts at a comprehensive university plan. SUNY at Buffalo did all of the above.

The need for a comprehensive university plan grew, despite the confusion of organization, governance, and management. The situation demanded leadership to persuade policy makers to decide and which now must assist managers to manage in the face of diminishing resources. Further, it must allocate those resources consistent with a policy statement to which the majority of the university community can subscribe.

The president of the State University of Buffalo announced during the spring semester of 1975 that the coming academic year would be one in which an intensive effort was to be made to develop an academic plan for the university. The president appointed a committee and charged it to develop and recommend an academic plan consistent with institutional goals and cognizant of a possible diminished resource availability responsive to the needs of both the university and its constituents, detailed to convey the future configuration of the university and to guide the budget development and resource allocation. That committee developed the following statements on University mission.

> As a state university with both teaching and research functions pertinent to local and urban regional concerns, the committee understands the university's community mandate to expand selectively and progressively its public service capacity beyond the primary responsibilities in research and teaching. Anything less than present academic excellence or the reasonable prospect of its attainment in the wide range of the university's academic program, constitutes an unacceptable situation. In the first instance, the rigorous intellectual discrimination normally characterizing intellectual life should not condone undistinguished programs. Second, an era of budgetary restrictions and state financial exigencies may leave the university only two future choices: general mediocrity at best, or selective superiority.

The university cannot willingly choose mediocrity. In its search for or confirmation of excellence, three kinds of criteria are suggested. These are the quality, need and promise of the academic programs of the university. It is axiomatic that while from some perspectives all programs may have some visibility and respectability, not all of them can be equivalent in the allocation of resources. Thus, where a program is presently identifiable as capable of or already manifesting excellence, as evidenced by premier research and teaching, strong student enrollments, and a high level of student satisfaction and employability, it would appear an obvious candidate for optimal support.

The suggested indices of performance considered by the president's committee were:

1. efficiency in using resources,
2. faculty scholarly and creative production,
3. interaction with other programs,
4. attractiveness of program to students,
5. employability of degree recipients.

The judgments made by the committee translated statements concerning mission and goal into criteria for judgment with the purpose of determining the degree to which any program supports the goals. These judgments concern:

1. the need for the program,
2. the type of clientele served,
3. the quality of programs,
4. public services activities related to program mission,
5. participation in multidisciplinary programs,
6. program efficiency,
7. resource needs.

The judgment ultimately made is to strengthen, maintain, diminish, or phase out the particular program for the bachelor, master, or doctoral level studies as it is presented by a particular program.

More than 130 academic programs and organized academic activities were evaluated and in February of 1976 the interim report of the president's committee on academic planning was distributed to the university community. It is instructive to quote the preface of that interim report.

> The President's Committee on Academic Planning wishes to indicate the context within which it operated. First, the members of the committee did not act as disciplinary or identity group representatives. Second, the committee did not act as a budget committee. Third, the committee wishes to stress that this is necessarily an interim report focused solely upon the present positional profiling of each of the university's operative academic units and programs. It is in that frame of reference that its present recommendations have been advanced. The committee is fully aware and wishes the university community to be aware that the fourth phase of its deliberations, which involve consideration of what new programs and new directions the university may wish to pursue, will require reflection and review beginning with the status profile developed here. This may lead to recommendations for realignment or reconstitution of some programs already reviewed.

In general, difficulties encountered by the committee apart from those of incomplete data can be characterized as resulting from data being available in a form primarily relevant to the kind of teaching and research that occurs in the majority of the departments, while in some programs a significant function of the effort is devoted to the delivery of education or service in very different modes. For example, a question arises concerning the appropriate assessment of the place and the significance of the noncurricular activities of the colleges which impose a load on faculty and staff and occupy student time, and which are supported out of the same budget as the curricular activities. In addition, some curricular activities sponsored by the colleges are supported by departmental budgets. The most prominent problems occur in assessing programs with a clinical component or programs which support clinical instruction through the clinical departments. Clinical instruction is provided by faculty with a number of different types of appointments in the university, in locations both entirely within the university, the Dental Clinic, and entirely outside, the associated hospitals, and is paid for in a number of arrangements. Clearly, it is not directly comparable in any dimension with classroom instruction in a nonclinical program. An analysis of clinical programs reflects more similarities than differences with nonclinical departments, but differences are numerous enough and interactions complex enough that in the absence of serious study and a different data base, only general comments about the clinically-based programs could be made. The same problems arose when the Basic Science departments of the Health Sciences were considered. The participation of research faculty from the Basic Science departments, along with practicing clinicians from the clinical departments in the instruction of clinical students is an important facet in maintaining the quality of American medical education. These faculty may also engage in the supervision of school or hospital clinics or clinical laboratories.

The relationship of department size and cost to information available on course registrations, credit hours delivered, student demand and so forth, when the department has such multiple missions, is difficult to assess on the same basis as nonclinical departments. For example, art and music, each with both studio and academic programs, present some of the same difficulty, though not, perhaps, as complex.

The principal problem is the development of a common data base.

The next major function was the development of the final report, with recommendations to be submitted to the President and the university community. The title, Report on the Future of the University.

This report addressed its effort to a statement of mission, a profile of the university, in general, its statistical profile, its area of strengths. It next addressed influences and forces influencing the specific university in terms of (a) societal demand, (b) untapped clientele, (c) support for students, (d) level of university support (1. federal, 2. state), (e) the state master plans, reports on the commission on priorities, and (f) increased influence of external institutions in university operation.

The general responses to influences upon the university are summarized in improved self description, increased mutual understanding and support, improved operational performance of units, improvements of educational operation and program responses. Directions for the future include educational programs in general education, liberal studies, American culture, language programs, a School of fine and performing arts, and addressing the needs of new clientele. The areas of research include technological and sociological assessments and the development of basic information. Means of implementation with a general commentary, faculty development, multidisciplinary research, selective program improvements, research and training support, developmental resources and the maintenance of balance, conclude the directions for the future.

Unsolicited but also included are two sections concerning first, university administration and the academic plan and second, a future of planning activities for the university. It may be instructive to close with the final set of recommendations concerning administration and the planning office. "The University administration give careful attention to its interactions with operating units, that a planning office be organized within the president's office, that a planning committee be continued."

Now, what is of importance to institutional planners about all of this?

Conclusions

First, there is no institutional research office at Buffalo. All the data came from public documents existing within the University, and assembled by graduate assistants working for the Committee.

An obvious concern was the accuracy of the data submitted. Some errors were found but certainly some were not. Some data was incomplete, and never were found. Grave decisions hung on very slender evidence at times. Accuracy is impossible to over-emphasize. Data validity is a sine qua non.

Second, academic planning does not exist in a vacuum of external events or influences. The political realities of a legislative power controlling resource allocations, both at the Federal and State level, cannot be ignored. Massive shifts in support money can, does, and ought to modify some University effort. However, for the institutional researcher, the major emphasis and functions should be directed to the marshalling of evidence, valid, reliable, and germane. A major question has to be which evidence to gather and to display.

We would all feel better if all the evidences were objective. They are not, and cannot be so. One small monograph of thirty pages can change the entire research focus of a major science from an organismic approach to cell and molecular biology. It "counts" only as one publication in a referred journal. All the evidences must be weighed upon a subjective scale, and errors are to be expected from the outset. Evaluation requires judgment.

Third, the style of institutional leadership is critical to the design, implementation, adoptions and management of an institutional academic plan. Without deep involvement of distinguished and respected faculty (and some others), no academic plan worth the name will evolve. Without leaders we founder.

Last, democratic processes work. Any institution will tolerate deviance until a tolerance limit is reached. Once over that threshold, reactive corrective measures will be applied. Often the data gatherer has to feel ignored. That reports are sent out and never read. That policy makers don't decide, and that managers do not manage. Take heart, faculty, administrators, and students hear you. They don't often listen, but they hear you, and they need you. Seek facts, think straight and look far ahead.

MEASURING THE OUTCOMES OF HIGHER EDUCATION TWO APPROACHES BASED ON PROGRAM CHARACTERISTICS AND PERCEIVED NEEDS OF EXTERNAL AGENCIES

Richard L. Alfred
New York City Community College

Researchers and planners have known for a long time that evaluation is supposed to begin with a statement of educational objectives. And every good manager knows that evaluation includes an assessment of program costs which is supposed to involve some consideration of program outcomes. In the field of community college education, however, these basic rules have often been ignored by administrators and external agencies attempting to carry out evaluation studies. Educational master plans, for example, developed by community colleges, have little to say about outcomes or costs even though these plans contain a variety of propositions concerning financing, programs and organizational structure.

Two-year college faculty, department chairpersons, and deans engaged in making annual recommendations on how academic departments should be budgeted, as a matter of policy do not include any consideration of outcomes. Year-in and year-out, program budgets are determined on a percentage basis as an increase or decrease from the previous year's budget. This practice, as long as it is continued, can hardly be expected to encourage faculty to deal with outcomes in their programs and budget decisions.

External Pressures for Accountability

While it is not entirely clear why the outcomes issue has been avoided by colleges and their internal constituencies, it is becoming increasingly clear that state boards and legislatures are interested in higher education outcomes. Policy makers are becoming ends-oriented rather than means-oriented. The attitudes of funding sources clearly reinforce this trend: college should be rewarded not only for the number of programs and services they offer, but for the outcomes they produce and the cost benefits to the consumer.

Although it is perhaps unfortunate that higher education agencies are requiring institutions to provide evidence of outcomes in return for resources, it is likely that many policy questions would be much easier to settle if we had a better understanding of the outcomes problem. The issue of program budgeting, for example, is one topic that has stimulated a good deal of debate: At what level should programs be funded? What types of measures should be used to determine program funding? Who should make the hard decisions on funding? What criteria should be used to determine funding levels? Should programs be funded on a "relative" basis (as an increase or decrease over the previous year's budget) or on an "absolute" basis as a measure of the minimum amount of resources needed? Such issues would be readily resolved if data were available on the outcomes that are actually generated by two-year college programs. How many students are enrolled in a program and what number of credit hours do they represent? How many complete their degree requirements within two years, three years, and so forth? What is the cost per FTE student? Do the outcomes produced meet or fall short of a minimum acceptable standard? What are the cost benefits to the consumer?

The major premise of this presentation is that much more research needs to be done on the outcomes of community college education before community colleges can be truly evaluated or receive their fair share of resources. The studies described herein relate to outcomes in career programs, to the characteristics of these programs, and the information needs of external agencies. Suggestions are made as to how outcome measures might be used to improve the position of higher education institutions in their quest for resources.

Outcome Measures and Decision Making

While there are many possible methods that can be used to measure outcomes in community college programs, a fundamental purpose of outcome-oriented research should be to produce information that can be used by decision makers to determine the resources for career programs. Outcome data are most likely to be useful if they are based on an understanding of the resource allocation process itself, particularly that involved in the relationship between the institution and the state.

The need for rendering a decision relative to the resources for community college programs implies the existence of two fundamental conditions: some recognized educational objective and limited resources for achieving this objective. Decisions on higher education appropriations typically involve a choice between available means by which manpower and educational requirements can be met. In a densely populated urban region, for example, these means might include funding two-year college programs to meet the technical and manpower requirements of business and industry; support for baccalaureate degree-granting institutions to meet mid-management and human service needs; and support for professional degree-granting institutions to provide trained professionals for emerging manpower needs in health, engineering, and the social services.

Every appropriations decision is predicated on a belief in the existence of a causal relationship between some educational outcome and the resources allocated to achieve that outcome. Rational decisions concerning program resources can be rendered by consulting the available information in a college regarding the outcomes it is trying to produce and balancing this with information about the outcomes it has actually produced. The principal function of outcome research is to extend this fund of information to help decision-makers--both within and outside of the institution--to better understand the consequences of the resources they are employing.

Two studies were conducted on outcomes in curriculum programs in the Allied Health and Natural Science and Engineering Technology divisions of New York City Community College during the Fall of 1975. These studies were designed to identify student outcomes pertaining to their career patterns, their transfer plans, their perceptions of college curricula, and their attitudes toward work and further education. The study populations consisted of 922 graduates of the Division of Technology between 1969 and 1975, and 595 respondents from the Division of Allied Health and Natural Sciences. Questionnaires were sent to graduates of these programs during the Spring and Fall of 1975. Approximately 44 percent returned usable questionnaires. The response rates varied over the seven-year period ranging from a low of 35 percent in 1969 to a high of 60 percent in 1975. The overall response rate of 44 percent was considered a gratifying return for studies of this kind.

Because the number of outcome measures used in each study was very large, a taxonomy was developed not only for classifying existing measures but also for suggesting additional ones (see Figure 1). This taxonomy was based on the traditional functions of two-year colleges: teaching, student development, and public service. The first dimension of the taxonomy was comprised of three categories: career preparation, transfer preparation, and public service. The second dimension involved the time dimension in which outcomes in each category were measured: before college, during college, and after college.

The categories in each dimension are to some degree interdependent. Certain transfer and career preparation outcomes, for example, can be evaluated through analysis of the same outcome measures. Thus, one of the critical outcome measures of a student's preparation for transfer or a career is his grade point average in the major field of study. By the same token, one of the most important aspects of a student's public service is his participation in organized community activities. Public service can be assessed in terms of the quality and quantity of student involvement in the community at every point in his relationship with the college--before he enrolls, during enrollment, and after graduation. Each outcome is classified simultaneously by the type of function involved and its temporal sequence in the college environment.

Institutional Functions. The institutional function dimension was used to assess the effects of college programs on various student outcomes under consideration. The outcomes in each study differed according to the characteristics of the programs being studied and the function being examined. For example, students enrolled in the Allied Health program are required to successfully complete a licensure examination before they can practice in their career field. The outcomes investigated in this study were those under the general rubric of career preparation but particular to the examination results and curricular perceptions of students (see Figure 2). Students enrolled in Technology programs, on the other hand, are not required to take a certification exam as a condition for career entry. The focus shifted in this study from a concern with examination outcomes to a concern with job performance. Measures such as salary, job mobility, supervisory responsibility and employer perceptions were used to evaluate performance on the job (see Figure 2).

Figure 1

Taxonomy of Outcome Measures

	Career Preparation	Transfer Preparation	Public Service
Pre-College	choice of career (while in high school) high school curriculum high school grades	pre-college aptitude in reading, math and writing (interest tests) high school curriculum high school grades	community activities while in high school
College	grades (general courses) grades (major field) change of major withdrawal graduation/honors career-related employment(while in college) student perceptions	grades (general courses) grades (major field) change of major withdrawal graduation/honors student perceptions choice of transfer institution time to finish program	community activities while in college
Post-College	job entry certification/licensure scores salary supervisory responsib. job mobility promotions job-relatedness of college curricula professional license student perceptions employer perceptions	enrollment in transfer institutions grades advanced degrees honors student perceptions years to finish advanced degrees	place of residence (in or out of community) community activities

The Time Dimension. Classified into a temporal dimension, the functions in Figure 2 portray the sequence of the outcome measures used in both studies. Although it is not often considered in the deliberations of educational policy makers, time is a critical element. Is it more appropriate to make decisions on the basis of immediate outcomes of the college experience--that is those that are evident after only a brief span of time--or the outcomes which show the long term effects of higher education? This is a question that college officials and external agencies must grapple with. From the standpoint of those determining institutional support, the long-term effects are too remote and too difficult to comprehend to be used in appropriations decisions. Their primary interest lies in much more immediate outcomes: How many students were graduated? How many retained jobs in the local community? How much was spent to produce certain outcomes? Did the outcomes produced meet a minimum standard for continued funding? Questions such as these require answers if two-year colleges are to obtain the resources needed for programs.

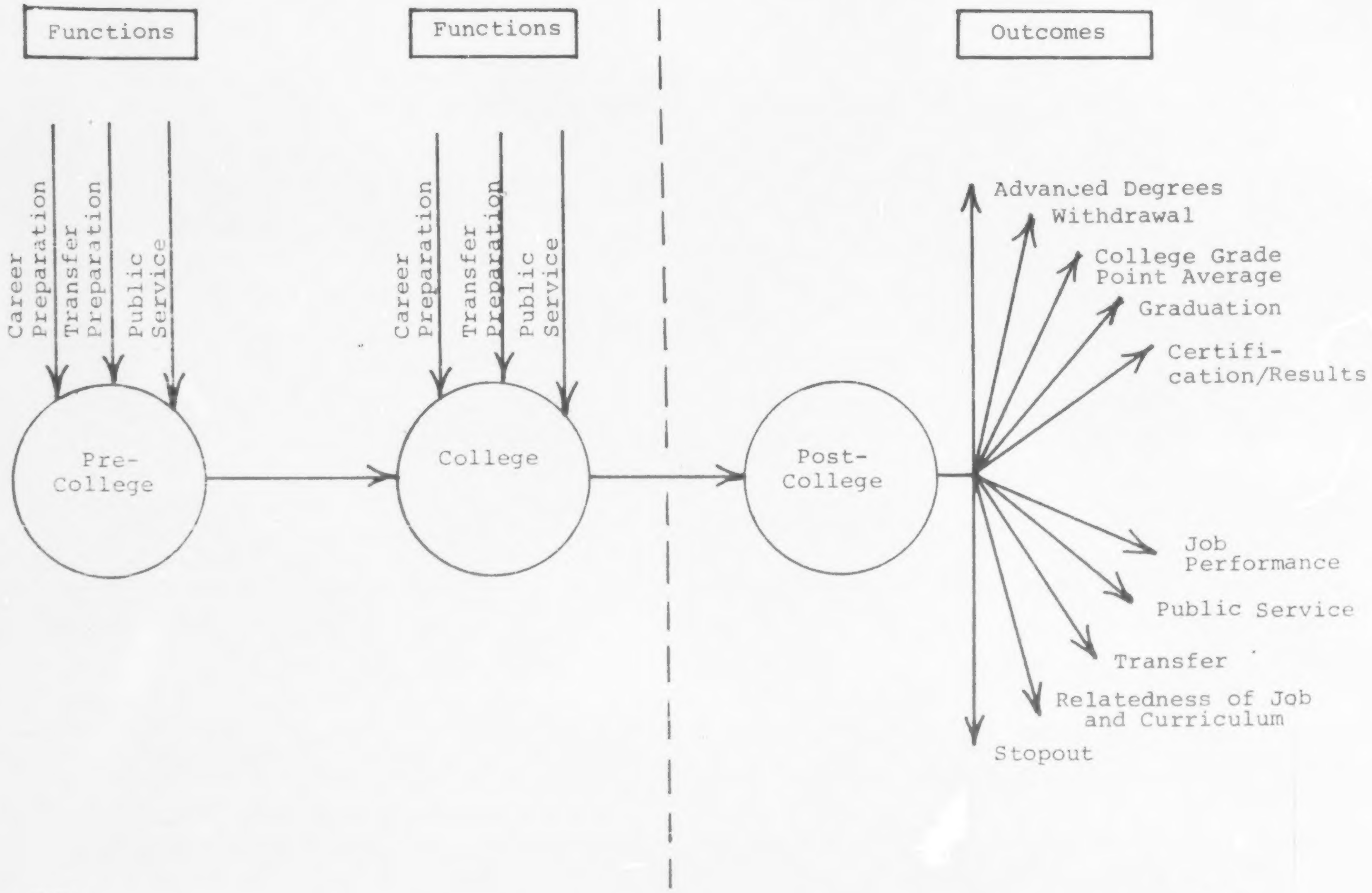
Political Uses of Outcomes Research

The call for outcome data is becoming increasingly persistent on the part of state boards and legislators. It reflects in part a failure of confidence in many of our institutions and in part frustration over rapidly increasing costs. What purposes can be served by the results of the studies reported herein? Those who wish to hold institutions accountable should become the recipients of outcomes data and should use such data to examine results and costs in the educational enterprise. The exchange of information between institutions and agencies cannot but help to bring some rational element to all questions relating to resources.

Published results of outcomes studies lend a focus to the types of resources needed to operate programs. They separate questions related to purposes and procedures and permit educational policy makers to develop a better understanding of the educational process. In this sense, outcome data is a weapon. It can be used to educate the policy makers about the academic and institutional facts of life, providing them a far better, more complete and comprehensive picture of the academic enterprise than they now have. Tending

Figure 2

Outcome Measures For Career Programs



to relationships with state agencies has become an increasingly important and time consuming task for community colleges. Failure to provide the types of information that these agencies should use in the resource allocation process could result in some severe short-term penalties.

THE USE OF ACADEMIC HISTORIES IN DECISION MAKING

Robert Grose
Amherst College

The use of individual learning histories is of long standing in psychological and educational research. Few recent studies are available, however at the collegiate level (C.F. Blackburn et al. 1976). Current emphases appear to be those of atomistic data elements and short term, cross-sectional analyses. Yet I am urging here a return to the longitudinal study of individual students to aid our academic decision making.

There are several factors influencing my interest. One cluster relates to non-traditional institutions. Such things as narrative transcripts at Goddard College and New College in Sarasota, progress by examination at Hampshire College, the approach of Edison College in New Jersey, the exploration of competency assessment by Alverno College, the School for New Learning at De Paul University, the Cooperative Assessment of Experiential Learning (CAEL) and the development of the concept of life-long learning so ably delineated by K. Patricia Cross--all insist upon the unique character of each student and his experience. These developments further suggest such other possibilities as campus-free, space-free, credit-free, and time-free modes of learning.

Part of my motivation, I suspect, also comes from my discomfort with the depersonalization and mechanization that is taking place in many of the data management systems and models for resource allocation. I looked up the other day the definition of student in the NCHEMS *Data Element Dictionary* and was taken aback that a student is defined there solely as "An individual who has formally applied for admission at the institution" or "an individual who is making a demand on the instructional resources of the institution." Nothing focused on the accumulation of educational experiences by the student himself or herself, but items featured faculty, facilities, finances, costs, information exchange, program measures, resource requirements or state-wide measures. The integrated singular human being called the learner was hard to find.

The third source of stimulation was a recent batch of questions coming from faculty, students, faculty committees, and administrative offices. They asked about how one course leads to another, how many students in their career take courses in a field and how many do not, and what is the concentration of enrollments in a department among its majors as against general education elections. What were the results of a special freshman section in terms of later selection of courses in that field? How effective was advising in terms of the breadth of electives of students? How useful was their freshman seminar experience in opening up new areas of study to students and so forth. Thus, I was led to consider more seriously and in varying detail the unique educational experience of each student as he or she goes through four years of study taking four courses at a time, moving from one level of course to another, sampling one domain of knowledge and another, accumulating 32 courses, undergoing failures, successes, disappointments and insights.

Let me turn to some examples: Example 1: The Mathematics Department asked me to help evaluate the results of their special Mathematics section for those students who were judged not to be well prepared for the study of calculus by their secondary schools. A special Introductory Calculus section met for six class hours a week rather than the usual four and was given special attention in terms of tutors, assignment of instructor and rate of development of topics. At the end of the semester, these students were expected to reach the same level of competence as those in the "regular" course. To answer the question meant going back and identifying specific individuals six, seven, and eight years ago and examining their performance in the special section of the calculus course, their later choice of majors, their election of later mathematics courses and the like. It was fairly laborious and took many hours of clerical work to get even a partial picture of some of the answers to the Department's legitimate educational questions about what had happened to these students and what effect the course may have had upon their later studies.

Although we do have a relatively sophisticated computer system with a person-oriented data base, it was impossible to go back via the computer and reconstruct the total histories of individuals with a particular educational experience, namely, participation in a particular course and section. We did this by hand and were able to demonstrate mixed results, these in turn led to a further analysis of the performances of students with comparable backgrounds that were in the regular calculus sections. (All of this led to dropping the special section and making provisions for student diversity in regular sections.)

My second example is drawn from the humanities. Here, a faculty member of the English Department was interested in what courses English majors actually took within the department since they were given a rather free rein to choose among a large number of English offerings. Moreover, he wondered how many students would have satisfied a reasonable set of requirements that would have ensured that English majors experience several different areas of literature and modes of study. Most enrollments had been at least of moderate size in English courses during the years in question. It turned out that after a great deal of clerical labor, we were able to ascertain that very few of the English majors in their ordinary selections would have completed a program anything like the one proposed. For example, there was only one out of the 60 majors that had taken all seven of the courses seriously proposed as the core curriculum. Changes in the major requirements in English are therefore now being overhauled.

The most complex query to date (and my third example) came from our Committee on Educational Policy and, later, the Select Committee on the Curriculum. Since at Amherst College we currently have a distribution-free elective program with required courses only in the major, students have considerable latitude in selecting their courses both on the campus and at the rest of the Five Colleges in the Pioneer Valley. The central question was: What kinds of liberal education are our students choosing?

A summary of the academic history file of our graduating students in the Class of 1976 was printed out showing the number of courses taken in each of the departments or course groupings. These were summarized by divisions: Division I - Humanities and the Arts; Division II - Social Sciences; Division III - Natural Sciences and Mathematics; Division IV - Independent Study, Interdisciplinary courses, special reading courses, and the like. We also counted up the courses taken at the other of the Five Colleges: Mount Holyoke, Hampshire, Smith, and the University of Massachusetts. By grouping students by their majors we were able to gather even further information.

How best to display these data is not clear. One approach is found in Table I showing simply the counts of numbers of courses taken within each division sorted by increasing order of magnitude. We did this first by Division I - Humanities, as in the example, and then the same thing sorted by Division II - Social Sciences, and Division III - Natural Sciences. (Only a single example is given here to show how this would appear.) Table I gives an overall picture of the way in which individual students allocated their courses in broad curricular areas and gives the detail rather compactly for the some 222 students in the sample. Note that the median number of courses in Division I is quickly judged.

In another approach one may simply count departments that are sampled by each student and one composite graph (Figure I) shows for these same 222 students the number of departments they sampled in their four years at Amherst. (The mean and median are 12.5 of departments chosen.) But the mean is perhaps not as important as the dispersion that is demonstrated. We have done this also for major groupings and for Phi Beta Kappa students.

If one collects the total programs of students and sums them together over time, one gains helpful pictures of the education that is occurring. In Table II may be seen how some 289 students of the Class of 1976 distributed their 8,617 courses over four years among the various departments, both in terms of numbers of courses and in terms of percentages. Majors in the three Divisions of Humanities, Social Sciences and Natural Sciences do distribute their courses differently. Note that this is not the same as a course load matrix carried out only for a year or semester, but is the result of the course programs of individual students over their total academic career.

In Table III for the same class of 289 students with overall figures are shown of how many had one or more courses in particular departments sometime in their four years. The series of columns at the right are related to questions we had about our pre-medical and pre-law students in the class. What kinds of courses had they sampled or not sampled?

The degree of concentration within the major department by students may also be of interest to decision makers. The numbers at a small college are often sufficiently small to make much generalization shaky on a single year's basis, but in Table III, for example, 38 English majors over the four years took 381 courses in English, or an average of about ten per student; this is something close to one-third of their courses. We had anticipated more concentration by students on the average in their major departments.

Finally in Table IV the arrangement is shifted the other way around. The total courses given by a particular department are examined to see who actually took them. Looking at the fourth row, for example, we find that the English Department over the four years for this Class of 1976 had 942 course enrollments (shown on the far right). We have already noted that 381 of these were taken by the 38 English majors. In other words, 40% of the department's course enrollments (381/942) were devoted to its own majors.

I have no brief for these being definitive or crucial data. They are first attempts--attempts to find descriptive techniques so that the varieties of student patterns of course programs can be understood.

An unpublished paper by Alexander W. Astin asking for a Student-Oriented Management Information System notes in its introductory paragraphs: (Astin, 1976)

> Although most college catalogs claim that student development is a fundamental institutional purpose, the decision-making process in higher education often ignores the student implications of alternative courses of action. This tendency is exemplified by the computer-based management information systems (MIS) now used by many colleges and universities. Except for simplistic information on enrollments, majors, and credits, these systems provide almost no information on students. Thus, administrators who rely on such systems are encouraged to view planning and decision-making basically as a problem in resource manipulation. The 'benefit' side of the decision equation, as it reflects the probable consequences for student development, receives scant attention at best and in most cases is ignored altogether in the decision process.
>
> Those administrators who might be sympathetic to a more student-oriented MIS have seldom made a serious attempt to develop one, because they believe it is simply unfeasible. Not only is such a system feasible, but it would provide an opportunity to improve the quality of planning and decision making substantially and, in the long run, to put scarce educational resources to much more effective use....

We are not yet very far along in providing such information. We are presently recording only partial and indirect indications of what the student has learned. But even with our simple tallies, there are a number of difficulties.

Most of our computers do not maintain cumulative records over a sufficiently long period of time to enable such analyses. Frequently only a semester or two are available and labels are produced to make a hard copy for a permanent transcript.

Another problem we encountered is that transfers from other colleges or from other schools within a university will not always have all of their materials in the same sortable rubrics. A significant portion of an institution's students may be transfers, have had educational leaves of absence, or have either credit by examination or by assessment of experiential education. These discontinuous records are not to be derogated but simply must be set aside for certain sorts of analyses. Experiences and courses taken prior to post-secondary education are usually not included either. Such factors only point up the magnitude of the challenge to find new and meaningful ways to describe the continuous student.

The program of the student has the characteristics of being both an independent variable and a dependent variable. To use Astin's terms, the one academic history can be viewed both as an outcome measure and a process measure. That is, the selection of courses may be looked upon as the end result or outcome of other variables such as academic advising, particular student characteristics, or experience in earlier courses, whereas at other times we may wish to look upon the student's variety of courses as a process affecting later performance in such things as the Graduate Record Examination, acceptance at medical school, performance on the job, or student-expressed satisfaction with his or her general cultural knowledge.

One may have a bit of serendipity. As I have carried out some of these comparisons with the class that graduated last June, I found myself asking odd questions such as the extent that Amherst College had given the courses needed for graduation for this class. I discovered that 10% of the Class of 1976's courses had been taken at the Five Colleges; another 7% had been taken at other institutions by transfer students, those on educational leaves, and such. Thus only 83% of the courses for graduation had been delivered at Amherst. (I will not dwell on the fact that we have also been providing literally hundreds of course enrollments for the incoming Five-College students, so it does happen to more than balance out in this case.)

You may also find it interesting to check on the "potato chip" hypothesis. One graduate student working with us developed this notion while he was examining how many courses were taken in a particular department by students. For some departments it seems that students seldom take just one course; they take either none or two or more. As yet, I do not know just how this relates to our planning or staffing, but certain content and certain faculty show rather consistent choices by students. I am also convinced that most departments would prefer to be in the "potato chip" or "salted peanut" category where once you take one you can hardly resist taking more.

You can see that I suffer from one of the serious diseases with which we in institutional research are afflicted, namely, I have more answers than I yet have questions. I am intrigued by the patterns of student choice in growth and learning. I feel that these longitudinal data about individual courses of study belong somewhere in our scheme of things. As our colleges shift away from expansion to their management of scarce resources, academic decision-making will without doubt call upon our knowledge of students' learning histories. We must examine benefits as well as resources and costs.

BIBLIOGRAPHY

Astin, Alexander W. "Evaluative Research and the New Colleges." Chapter 12 in *The New Colleges: Toward an Appraisal*, Iowa City, Iowa: American College Testing Program, 1971.

Astin, Alexander W. "Student-Oriented Management Information Systems." Higher Education Research Institute and University of California, Los Angeles. (Unpublished paper) 1976.

Blackburn, Robert et al. *Changing Practices in Undergraduate Education*. Berkeley, California: The Carnegie Council on Policy Studies in Higher Education, 1976.

National Center for Higher Education Management Systems at WICHE. *Data Element Dictionary: Second Edition*, Technical Report #51. Boulder, Colorado: NCHEMS/WICHE 1973.

TABLE 1

INFORMATION ON DISTRIBUTION OF STUDENT COURSE ELECTIONS BY CURRICULUM DIVISIONS
CLASS OF 1976 N = 222

DIVISION I - Arts and Humanities; DIVISION II - Social Sciences; DIVISION III - Natural Sciences and Mathematics; DIVISION IV - Other Amherst Courses (e.g. Freshman Seminars); COLUMN V - Five-College Courses

CLASS OF 1976 --DIVISION 1 SORT

DIVISION

1	2	3	4	5
1	15	10	3	3
2	6	21	0	3
2	9	10	1	10
2	12	15	2	1
2	15	12	2	0
2	20	1	1	7
2	21	1	1	6
2	23	4	0	2
3	8	18	1	4
3	9	15	0	4
3	15	3	0	10
3	21	3	1	4
4	4	18	2	5
4	4	19	3	2
4	11	11	4	1
4	11	16	0	1
4	13	2	2	6
4	17	6	1	2
4	25	1	1	5
5	2	19	2	2
5	3	20	2	3
5	4	14	1	8
5	5	14	1	8
5	5	14	3	4
5	7	10	0	10
5	9	13	3	1
5	12	6	4	4
5	12	11	1	4
5	15	5	2	4
5	17	1	2	5
5	17	4	1	3
5	17	4	1	5
5	17	5	2	3
5	19	3	4	1
5	22	0	1	4
6	1	22	1	1
6	2	17	2	4
6	5	17	1	0
6	9	13	2	2
6	9	15	2	8
6	10	1	3	12
6	10	8	5	3
6	11	7	4	5
6	12	8	2	4
6	12	10	2	1
6	15	3	2	6
6	16	5	1	3
6	17	2	1	7
6	17	3	0	5
6	17	6	0	2
6	19	0	1	7
6	19	6	1	1
6	19	3	1	3
6	19	3	4	0
6	20	4	0	1
7	2	11	4	9

DIVISION

1	2	3	4	5
7	2	17	3	2
7	2	18	2	4
7	3	17	5	0
7	5	16	0	3
7	5	16	1	1
7	5	17	1	1
7	5	18	0	1
7	6	15	1	4
7	6	15	1	4
7	6	15	3	1
7	6	16	2	0
7	6	17	2	2
7	7	12	0	6
7	7	13	1	3
7	7	14	2	1
7	7	15	1	2
7	7	17	1	0
7	8	12	2	2
7	11	3	2	9
7	12	1	4	8
7	13	0	1	11
7	13	2	2	7
7	14	10	1	0
7	15	1	2	7
7	15	4	2	4
7	17	0	1	5
7	17	3	3	2
7	18	5	2	2
8	1	16	1	8
8	3	17	2	1
8	5	17	1	1
8	7	13	1	4
8	7	14	1	1
8	10	0	5	7
8	10	8	1	5
8	10	11	1	1
8	10	12	1	1
8	11	10	2	1
8	12	3	1	7
8	12	6	2	3
8	12	7	3	2
8	12	10	2	2
8	14	4	3	3
8	14	7	1	2
8	16	3	3	1
8	18	2	2	1
8	18	3	2	0
8	19	2	2	0
9	2	18	1	4
9	3	18	1	0
9	5	16	0	2
9	6	17	1	0
9	7	13	2	1
9	7	14	2	0
9	8	8	2	4
9	9	3	2	10

DIVISION

1	2	3	4	5
9	10	1	0	10
9	10	9	1	4
9	13	1	1	8
9	13	2	1	5
9	13	2	2	5
9	13	3	1	5
9	13	5	2	3
9	13	5	2	3
9	14	1	1	5
9	14	1	1	6
9	15	1	2	3
9	16	4	1	2
9	17	1	4	0
9	17	2	1	4
9	17	2	2	1
9	17	3	1	1
10	4	15	0	7
10	4	16	2	2
10	7	13	0	1
10	8	15	0	0
10	10	12	1	2
10	13	1	6	1
10	13	3	3	3
10	13	4	2	3
10	14	2	1	4
10	16	2	1	4
10	19	0	1	2
11	3	11	0	7
11	3	15	2	1
11	5	11	1	6
11	5	13	1	2
11	8	1	4	7
11	9	1	5	6
11	12	6	1	2
11	13	2	2	3
11	15	2	1	3
11	15	2	2	1
11	16	2	1	2
12	3	5	1	0
12	3	13	2	1
12	4	3	2	11
12	4	13	0	3
12	4	14	1	0
12	11	1	2	8
12	14	2	4	1
12	15	0	1	8
12	15	2	0	3
12	15	2	1	0
13	2	14	2	0
13	3	11	2	4
13	6	5	4	4
13	7	7	2	3
13	11	3	3	2
13	11	7	1	0
13	17	1	0	1
14	0	0	1	17

DIVISION

1	2	3	4	5
14	1	4	2	11
14	2	5	3	7
14	3	13	1	2
14	4	1	2	11
14	4	7	1	5
14	10	1	2	5
14	11	1	2	4
14	12	0	1	5
14	15	1	2	4
14	18	1	5	3
15	3	1	3	10
15	3	13	0	0
15	7	2	1	5
15	7	2	1	5
15	9	1	3	4
15	14	2	1	0
16	6	2	1	5
17	5	8	1	1
17	7	3	3	2
17	9	4	1	1
17	10	1	1	1
17	14	0	2	0
18	1	4	1	10
18	1	12	0	0
18	3	10	2	0
18	4	0	3	6
18	4	3	3	2
18	4	5	2	1
18	4	7	1	1
18	4	8	1	0
18	5	0	2	5
18	6	1	1	1
18	9	1	2	1
18	9	1	2	1
19	3	3	1	5
19	3	9	0	1
19	4	2	1	6
19	5	1	1	5
19	5	3	1	8
19	6	1	2	4
19	11	2	0	0
20	7	2	0	4
20	10	1	2	1
21	5	2	2	2
23	2	1	5	1
23	8	0	2	1
24	2	4	0	3
24	5	1	0	5
25	1	1	2	3
25	5	2	0	4
25	6	1	1	2
26	7	1	1	5
27	3	2	1	0
29	4	1	3	0

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FIGURE I

COMPOSITE
NUMBER OF DEPARTMENTS SAMPLED BY STUDENTS N= 222

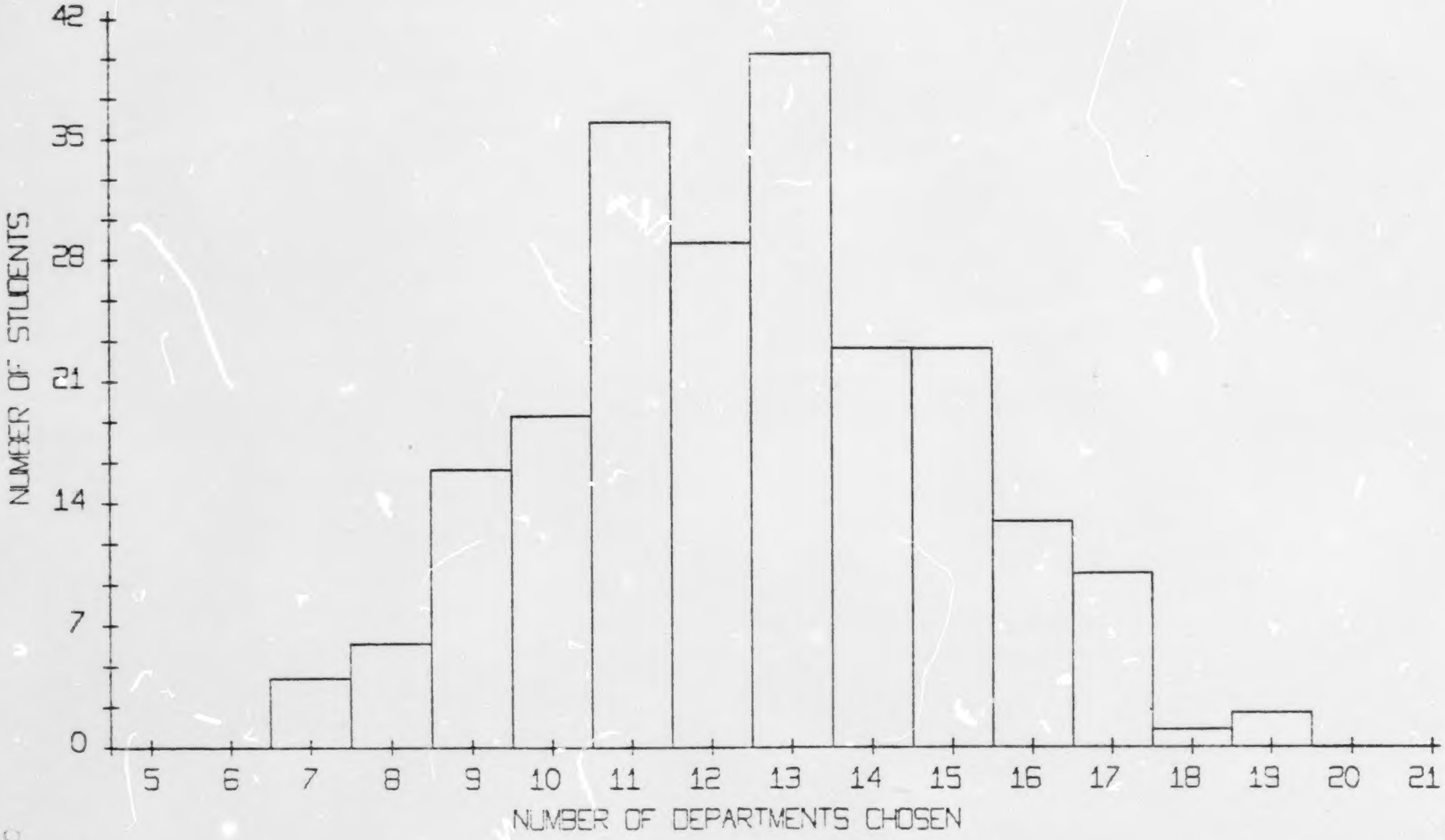

TABLE II

ELECTIONS OF COURSES
CLASS OF 1976 - AMHERST COLLEGE
4 YEARS

COURSES IN:	DIV. I 81 MAJORS		DIV. II 121 MAJORS		DIV. III 70 MAJORS		DIV. IV 17 MAJORS		OVERALL 289 Majors	
	Courses Elected		Courses Elected		Courses Elected		Courses Elected		Courses Elected	
	N	%	N	%	N	%	N	%	N	%
Art	129	5.3	99	2.8	57	2.6	13	2.7	298	3.5
Classics	22	.9	39	1.1	33	1.5	1	.2	95	1.1
Drama	48	1.9	45	1.3	10	.5	2	.4	105	1.2
English	471	19.4	286	8.1	144	6.6	41	8.5	942	10.9
French	131	5.4	64	1.8	33	1.5	13	2.7	241	2.7
German	39	1.6	7	.2	34	1.6	12	2.5	92	1.1
Greek	14	.6	3	.1	1	0	3	.6	21	.2
Latin	19	.8	6	.2	10	.5	2	.4	37	.4
Music	171	7.1	103	2.9	44	2.0	6	1.2	324	3.8
Philosophy	108	4.5	97	2.7	66	3.0	22	4.7	293	3.4
Religion	58	2.4	27	.8	10	.5	7	1.4	102	1.2
Russian	88	3.6	58	1.6	36	1.7	3	.6	185	2.2
Spanish	52	2.2	44	1.2	19	.9	4	.8	119	1.4
TOTAL	1350	55.7	878	24.8	497	22.9	129	26.7	2854	33.1
American St.	21	.9	129	3.6	12	.6	3	.6	165	1.9
Anthropology	55	2.3	111	3.1	34	1.6	17	3.5	217	2.5
Black St.	20	.8	69	2.0	23	1.1	28	5.7	140	1.6
Economics	49	2.0	363	10.3	74	3.4	17	3.5	503	5.8
History	77	3.2	252	7.1	41	1.8	32	6.7	402	4.7
Political Sci.	110	4.5	405	11.5	67	3.1	20	4.1	602	7.0
Psychology	70	2.9	258	7.3	116	5.3	11	2.3	455	5.3
Sociology	23	.9	86	2.4	9	.4	11	2.3	129	1.5
TOTAL	425	17.5	1673	47.3	376	17.3	139	28.7	2613	30.3
Astronomy	11	.5	18	.5	30	1.4	2	.4	61	.7
Biochemistry	0	0	0	0	0	0	0	0	0	0
Biol. & Biophys.	68	2.8	67	1.9	260	12.0	25	5.2	420	4.9
Chemistry	67	2.8	51	1.4	300	13.8	18	3.7	436	5.1
Geology	17	.7	49	1.3	106	4.9	2	.4	174	2.0
Mathematics	59	2.4	120	3.4	152	7.0	33	6.8	364	4.2
Neuroscience	0	0	0	0	24	1.1	1	.3	25	.3
Physics	34	1.4	48	1.4	158	7.2	19	3.9	259	3.0
TOTAL	256	10.6	353	10.0	1030	47.4	100	20.7	1739	20.2
Colloquium	23	.9	44	1.3	29	1.3	10	2.1	106	1.2
Europ. Studies	9	.4	14	.4	4	.2	10	2.1	37	.4
Field Study	0	0	1	0	0	0	0	0	1	.1
Freshman Sem.	41	1.7	76	2.1	44	2.0	7	1.4	168	1.9
ndependent Sch.	1	.1	0	0	0	0	14	2.9	15	.2
sian Studies	0	0	1	0	0	0	2	.4	3	.1
nquiry	20	.8	21	.6	7	.3	2	.4	50	.6
nterdiscip.	0	0	0	0	0	0	10	2.0	10	.1
enan	13	.5	33	1.0	5	.2	1	.2	52	.6
TOTAL	107	4.4	190	5.4	89	4.0	56	11.5	442	5.2
ampshire	19	.8	41	1.2	14	.7	2	.4	76	.9
ount Holyoke	70	2.9	109	3.1	40	1.8	4	.8	223	2.5
mith	141	5.8	142	4.0	61	2.8	33	6.8	377	4.4
niver. of Mass.	48	2.0	145	4.1	60	2.8	21	4.4	274	3.2
ther	7	.3	5	.1	7	.3	0	0	19	.2
TOTAL	285	11.8	442	12.5	182	8.4	60	12.4	969	11.2
GRAND TOTAL	2423	100.0	3536	100.0	2174	100.0	484	100.0	8617	100.0

TABLE III

4-YEAR COURSE ELECTIONS OF STUDENTS IN THE AMHERST COLLEGE GRADUATING CLASS OF 1976

		THE ENTIRE CLASS N = 289		PRE-MEDICAL STUDENTS N = 60		PRE-LAW STUDENTS N = 52	
	Department	% Electing One or More Courses in the Dept.	% Not Electing Courses in the Dept.	% Electing One or More Courses in the Dept.	% Not Electing Courses in the Dept.	% Electing One or More Courses in the Dept.	% Not Electing Courses in the Dept.
DIV. I	Art	53.6%	46.4%	55.0%	45.0%	48.1%	51.9%
	Classics	31.1%	68.9%	40.0%	60.0%	32.7%	67.3%
	Dramatic Arts	23.2%	76.8%	16.7%	83.3%	26.9%	73.1%
	English	87.5%	12.5%	95.0%	5.0%	82.7%	17.3%
	French	42.2%	57.8%	36.7%	63.3%	40.4%	59.6%
	German	16.6%	83.4%	20.0%	80.0%	9.6%	90.4%
	Greek	3.1%	96.9%	---	100.0%	7.7%	92.3%
	Latin	6.9%	93.1%	6.7%	93.3%	9.6%	90.4%
	Music	49.5%	50.5%	60.0%	40.0%	57.7%	42.3%
	Philosophy	52.9%	47.1%	56.7%	43.3%	55.8%	44.2%
	Religion	22.8%	77.2%	26.7%	73.3%	11.5%	88.5%
	Russian	25.6%	74.4%	28.3%	71.7%	28.8%	71.2%
	Spanish	23.2%	76.8%	23.3%	76.7%	17.3%	82.7%
	Overall	99.3%	0.7%	100.0%	--	100.0%	--
DIV. II	American Studies	23.2%	76.8%	13.3%	86.7%	32.7%	67.3%
	Anthropology	41.2%	58.8%	36.7%	63.3%	30.8%	69.2%
	Black Studies	15.9%	84.1%	16.7%	83.3%	13.5%	86.5%
	Economics	60.2%	39.8%	50.0%	50.0%	80.1%	19.9%
	History	57.1%	42.9%	38.3%	61.7%	80.8%	19.2%
	Political Science	72.3%	27.7%	71.7%	28.3%	86.5%	13.5%
	Psychology	63.7%	36.3%	65.0%	35.0%	61.5%	38.5%
	Sociology	24.6%	75.4%	18.3%	81.7%	23.1%	76.9%
	Overall	98.3%	1.7%	98.3%	1.7%	100.0%	--
DIV. III	Astronomy	16.3%	83.7%	25.0%	75.0%	15.4%	84.6%
	Biology	54.3%	45.7%	100.0%	--	38.5%	61.5%
	Biophysics	.7%	99.3%	3.3%	96.7%	--	100.0%
	Chemistry	43.3%	56.7%	100.0%	--	19.2%	80.8%
	Geology	23.9%	76.1%	10.0%	--	23.1%	76.9%
	Mathematics	64.0%	36.0%	83.3%	16.7%	63.5%	36.5%
	Neuroscience	4.2%	95.8%	18.3%	81.7%	--	100.0%
	Physics	43.3%	56.7%	88.3%	11.7%	28.8%	71.2%
	Overall	87.1%	12.9%	100.0%	--	86.5%	13.5%
DIV. IV.	Colloquium	28.4%	71.6%	31.7%	68.3%	21.2%	78.8%
	Freshman Seminar	54.7%	45.3%	51.7%	48.3%	55.8%	44:2%
	Other	44.6%	55.4%	33.3%	66.7%	53.8%	46.2%
	Overall	82.4%	17.6%	71.7%	28.3%	80.8%	19.2%
5-College	Hampshire	18.7%	81.3%	13.3%	86.7%	11.5%	88.5%
	Mt. Holyoke	42.6%	57.4%	28.3%	71.7%	48.1%	51.9%
	Smith	56.7%	43.3%	45.0%	55.0%	55.8%	44.2%
	U. Mass.	46.4%	53.6%	35.0%	65.0%	40.4%	59.6%
	Other	1.7%	98.3%	--	100.0%	1.9%	98.1%
	Overall	87.5%	12.5%	83.3%	16.7%	84.6%	15.4%

TABLE IV

MAJORS (4 YEARS)
CLASS OF 1976

	DEPARTMENT	MAJOR N	NO. OF COURSES IN DEPT OF MAJOR	MEAN	% OF TOTAL IN DEPT	NO. WITHIN DIV. OF MAJ.	% WITHIN DIV. OF MAJ.	5-COLL. N	5-COLL. %	TOTAL NO. OF COURSES IN 4 YRS.
DIV. I	Art	8	62	7.8	25.1%	119	48.2%	59	23.9%	247
	Classics	1	0	0	0	11	57.9	8	42.1%	19
	Drama	1	15	15.0	46.9%	19	59.4%	4	12.5%	32
	English	38	381	10.0	32.9%	668	57.7%	90	7.8%	1157
	French	7	54	7.7	29.0%	99	53.2%	14	7.5%	186
	German	2	13	6.5	23.2%	27	43.2%	6	10.7%	56
	Greek	0	0	0	0%	0	0%	0	0%	0
	Latin	0	0	0	0%	0	0%	0	0%	0
	Music	6	84	14.0	42.2%	120	60.3%	27	13.6%	199
	Philosophy	8	53	6.6	23.8%	124	55.6%	33	14.8%	223
	Religion	3	23	7.7	24.5%	47	50.0%	14	14.9%	94
	Romance Lang.	1	0	0	0%	21	75.0%	1	3.6%	28
	Russian	3	40	13.3	41.7%	59	61.5%	8	8.3%	96
	Spanish	3	20	6.7	23.3%	36	41.2%	21	24.4%	86
	TOTALS	81	745	9.2	30.7%	1350	55.7%	285	11.8%	2423
DIV. II	American St.	16	87	5.4	17.1%	221	43.3%	79	15.5%	510
	Anthropology	5	33	6.6	21.2%	68	43.6%	27	17.3%	156
	Black Studies	2	27	13.5	40.3%	40	59.7%	15	22.4%	67
	Economics	29	254	8.7	28.5%	435	48.9%	113	12.7%	890
	History	14	107	7.6	29.9%	185	51.7%	33	9.2%	358
	Political Sci	29	221	7.6	28.2%	382	48.7%	88	11.2%	785
	Psychology	20	150	7.5	25.4%	252	42.7%	70	11.9%	590
	Sociology	6	35	5.8	19.4%	90	50.0%	17	9.4%	180
	TOTALS	121	914	7.6	25.8%	1673	47.3%	442	12.5%	3535
DIV.III	Astronomy	2	10	5.0	15.6%	37	57.8%	3	4.7%	64
	Biology	18	139	7.7	24.5%	271	47.7%	25	4.4%	568
	Biophys	2	4	2.0	6.3%	34	53.1%	6	9.4%	64
	Chemistry	15	120	8.0	26.7%	212	47.1%	17	3.8%	450
	Geology	7	80	11.5	35.2%	108	47.6%	10	4.4%	227
	Mathematics	7	59	8.4	27.1%	123	56.4%	7	3.2%	218
	Neuroscience	16	24	1.5	4.9%	197	40.4%	17	34.8%	488
	Physics	3	24	8.0	25.3%	48	50.1%	4	4.2%	95
	TOTALS	70	460	6.6	21.2%	1030	47.4%	89	4.1%	2174
DIV IV.	Asian Studies	1	2	2.0	6.3%	4	12.5%	8	25.0%	32
	European St.	2	10	5.0	15.9%	11	17.5%	7	11.1%	63
	Ind. Sch.	8	14	1.8	6.1%	21	9.1%	27	11.7%	230
	Interdis.	6	10	1.7	6.3%	20	12.6%	18	11.3%	159
	TOTALS	17	36	2.1	7.4%	56	11.6%	60	12.4%	484

TABLE V

ENROLLMENT IN DEPARTMENTAL COURSES OVER FOUR YEARS BY MAJORS OF THE VARIOUS DIVISIONS

AMHERST COLLEGE CLASS OF 1976

DEPARTMENT:	COURSES BY MAJORS IN THE DEPT.		COURSES BY OTHER MAJORS WITHIN THE DEPT'S DIVISION		DIVISION I HUMANITIES MAJORS		DIVISION II SOC. SCI. MAJORS		DIVISION III NAT. SCI. & MATH MAJORS		DIVISION IV OTHER MAJORS		OVERALL TOTAL	
Division I	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Art (Fine Arts)	62	21%	67	23%	129	44%	99	33%	57	19%	13	4%	298	100%
Classics	0	0	22	23%	22	23%	39	41%	33	35%	1	1%	95	100%
Drama	15	14%	33	31%	48	45%	45	43%	10	10%	2	2%	105	100%
English	381	40%	90	10%	471	50%	286	30%	144	15%	41	5%	942	100%
French	54	22%	77	32%	131	54%	64	27%	33	14%	13	5%	241	100%
German	13	14%	26	28%	39	42%	7	8%	34	37%	12	13%	92	100%
Greek	0	0	14	67%	14	67%	3	14%	1	5%	3	14%	21	100%
Latin	0	0	19	51%	19	51%	6	16%	10	27%	2	6%	37	100%
Music	84	26%	87	27%	171	53%	103	32%	44	13%	6	2%	324	100%
Philosophy	53	18%	55	19%	108	37%	97	33%	66	22%	22	8%	293	100%
Religion	23	23%	35	34%	58	57%	27	26%	10	10%	7	7%	102	100%
Russian	40	22%	48	26%	88	48%	58	31%	36	19%	3	2%	185	100%
Spanish	20	17%	32	27%	52	44%	44	37%	19	16%	4	3%	119	100%
TOTAL	745	26%	605	21%	1350	47%	878	31%	497	17%	129	5%	2854	100%
Division II														
American Studies	87	53%	42	25%	21	13%	129	78%	12	7%	3	2%	165	100%
Anthropology	33	15%	78	36%	55	25%	111	51%	34	16%	17	8%	217	100%
Black Studies	27	19%	42	30%	20	15%	69	49%	23	16%	28	20%	140	100%
Economics	254	50%	109	22%	49	10%	363	72%	74	15%	17	3%	503	100%
History	107	27%	145	36%	77	19%	252	63%	41	10%	32	8%	402	100%
Political Science	221	37%	184	31%	110	18%	405	68%	67	11%	20	3%	602	100%
Psychology	150	33%	108	24%	70	15%	258	57%	116	25%	11	3%	455	100%
Sociology	35	27%	51	40%	23	17%	86	67%	9	7%	11	9%	129	100%
TOTAL	914	35%	759	29%	425	16%	1673	64%	376	14%	139	6%	2613	100%
Division III														
Astronomy	10	16%	20	33%	11	18%	18	30%	30	49%	2	3%	61	100%
Biochemistry	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biology & Biophys.	143	34%	117	28%	68	16%	67	16%	260	62%	25	6%	420	100%
Chemistry	120	28%	180	41%	67	15%	51	12%	300	69%	18	4%	436	100%
Geology	80	46%	26	15%	17	10%	49	28%	106	61%	2	1%	174	100%
Mathematics	59	16%	93	26%	59	16%	120	33%	152	42%	33	9%	364	100%
Neuroscience	24	96%	0	0	0	0	0	0	24	96%	1	0	25	100%
Physics	24	9%	134	52%	34	13%	48	19%	158	61%	19	7%	259	100%
TOTAL	460	26%	570	33%	256	15%	353	20%	1030	59%	100	6%	1729	100%
Division IV														
Colloquium	0	0	10	9%	23	22%	44	42%	29	27%	10	9%	106	100%
European Studies	10	27%	0	0	9	24%	14	38%	4	11%	10	27%	37	100%
Field Study	0	0	0	0	0	0	1	100%	0	0	0	0	1	100%
Freshman Seminar	0	0	7	4%	41	25%	76	45%	44	26%	7	4%	168	100%
Independent Sch.	14	93%	0	0	1	7%	0	0	0	0	14	93%	15	100%
Inquiry	0	0	2	4%	20	40%	21	42%	7	14%	2	4%	50	100%
Asian Studies	2	67%	0	0	0	0	1	33%	0	0	2	67%	3	100%
Interdisciplinary	10	100%	0	0	0	0	0	0	0	0	10	100%	10	100%
Kenan	0	0	1	2%	13	25%	33	63%	5	10%	1	2%	52	100%
TOTAL	36	8%	20	5%	107	24%	190	43%	89	20%	56	13%	442	100%
Five-College														
Hampshire College					19	25%	41	54%	14	18%	2	3%	76	100%
Mount Holyoke College					70	31%	109	49%	40	18%	4	2%	223	100%
Smith College					141	37%	142	38%	61	16%	33	9%	377	100%
Univ. of Mass.					48	18%	145	53%	60	22%	21	7%	274	100%
Other (Amherst)					7	37%	5	26%	7	37%	0	0	19	100%
TOTAL					285	29%	442	46%	182	19%	60	6%	969	100%
			GRAND TOTALS		2423		3536		2174		484		8617	

NEAIR PARTICIPANTS

November 4,5,6, 1976
Henry Chauncey Conference Center

Participant	Title and Address
Alfred, Richard L.	Director, Educ. Research, New York City Community College 300 Jay St., Brooklyn, N.Y. 11201
Armstrong, David	Montgomery Community College 340 Dekalb Pike, Blue Bell, Pa. 19422
Baruch, Rhoda	Off. Career Development, Dartmouth College, Hanover, N.H. 03755
Beatty, George Jr.	Inst. Studies Office, Admin. Bldg., University of Mass. Amherst, Ma. 01002
Beck, Nancy	Inst. Res. Program for Higher Education, Rosedale, Rd. Princeton, N.J. 08540
Bell, Dennis D.	Vice President for Admin. & Fiscal Affairs, West Chester State College, West Chester, Pa. 19380
Beswick, Barry E.	Analytical Studies and Planning, Boston University, 141 Bay State Road, Boston, Ma. 02215
Blai, Boris Jr.	Director of Research, Harcum Junior College Morris & Montgomery St., Bryn Mawr, Pa. 19010
Booth, David A.	Associate Provost, Williams College, Williamstown, Ma. 01267
Boyle, Sister Agnes	Academic Dean, Mt. St. Mary College, Newburg, N.Y. 12550
Brandt, Hy	Director, Office of Inst. Research, Touro College 30 West 44 Street, New York, N.Y. 10036
Brennan, Robert J.	Director of Research, Bryant & Stratton 1028 Main St., Buffalo, N.Y. 14202
Broad, Molly C.	Director of Inst. Research, Syracuse University Skytop Office Bldg. Syracuse, N.Y. 13210
Browne, Clinton E.	Dean of Students, King's College of New York, Briarcliff Manor, N.Y. 10510
* Brown, Eric	New Hampshire College and Univ. Council 2500 N. River Rd., Manchester, N.H. 03104
Brush, Leonard	Director of Info. Systems, Room 308, Old Main Pennsylvania State Univ., Univ. Park, Pa. 16802
Campbell, Joseph	Off. of Planning & Inst. Res., New Jersey Inst. of Technology, 323 High Street, Newark, N.J. 07102
* Brown, Jerry W.	Vice President for Academic Affairs, Rider College, Trenton, N.J. 08602

Clayback, Thomas J.	Dir. of Inst. Res., Niagara County Community College 3111 Saunders Settlement Rd., Sanborn, N.Y. 14132
Coe, James B.	Asst. Dean, Rutgers University, University College New Brunswick, N.J. 08903
Coles, H. William, III.	316 Harriman Library, SUNY at Buffalo, Buffalo, N.Y. 14214
Cooley, Gary M.	Asst. V.P., Off. of the President, Univ. of Mass. One Washington Mall, Boston, Ma. 02109
Cromack, Theodore	Coord. Inst. Support; Johnson State College, Johnson, Vermont 05656
Curvin, Patricia	Rutgers University,
Cyros, Kreon	Director, Off. of Facilities and Management Systems, Mass. Inst. of Technology, Room E19-451, Cambridge, Ma. 02139
Deupree, John C.	Registrar, Rider College, 1083 Lawrenceville Rd., Trenton, N.J. 08602
Dollman, Elsie M.	Dir. of Inst. Research, Kean College of New Jersey Morris Ave., Union, N.J. 07083
Durzo, Joseph J.	Instructional Development Coord., New Hampshire College & Univ. Council, 2321 Elm St., Manchester, N.H. 03104
Elwell, Albert R.	Systems Office, University of New Hampshire, Durham, N.H. 03431
Espey, David M.	Dean of Registration & Registrar, Monmouth College, W. Long Branch, N.J. 07764
Evans, Hiram J.	Vice-President Inst. Res. & Planning, Curry College, Milton, Ma. 02186
Faricy, William H.	Director of Inst. Research, Montclair State College, Upper Montclair, N.J. 07043
Fenstermacher, William	Director of Educational Planning, Univer. of Mass. - Boston Harbor Campus, Boston, Ma. 02125
Ford, Andrew P.	New Hampshire College and University Council, 2321 Elm St., Manchester, N.H. 03104
Garcia, Juan	Budget Analyst, Univ. of Mass. at Amherst, 304 Admin. Bldg., Amherst, Ma. 01002
Gay, Diane	Columbia-Greene Community College, P. O. Box 1000, Hudson, New York 12534

Gell, Robert L.	Dean, Inst. Research, Montgomery Comm. College, 51 Mannakee St., Rockville, Md. 20850
Genevie, Lou	Off. of Program & Policy, CUNY, 535 East 80th St. New York, N.Y. 10021
Gerechoff, Jane S.	Res. Asst. to Dean of Registration, Monmouth College, W. Long Branch, N.J. 07764
Gonyea, Meridith	Dir. of Inst. Research, College of Medicine & Dentisty, 100 Bergen St., Newark, N.J. 07103
Goodwin, Dorothy C.	Dir. of Inst. Research, U 135, Univ. of Connecticut, Storrs, Ct. 06268
Gould, Loren	Inst. Research, Worcester State College, 486 Chandler St. Worcester, Ma. 01602
Greco, Marvin	Fairleigh Dickinson University
Grose, Robert F.	Registrar & Dir. of Inst. Research, Amherst College Amherst, Mass. 01002
Gunstone, Beverly	Registrar, Essex County College, 31 Clinton Avenue, Newark, N.J. 07102
Hagel, Phyllis	National Materials Development Center, New Hampshire
Hamberger, Barnett W.	Asst. to the V.P. for Acad. Review and State Acad. Relations, New York University, Elmer Holmes Bobst Library, Room 1102, Washington Square South, N.Y.,N.Y. 10012
Harris, Marilyn	Dir. of Mgmt. Info. & Plan. Systems, Brooklyn College CUNY, Boyland Hall, Bedford Avenue, Brooklyn, New York, N.Y. 11210
Haskell, David	
Heck, Richard	Inst. Planning & Research, Colgate University, Hamilton, N.Y. 13346
Heller, Lucille C.	Academic Activities, Rutgers University, 12 College Ave. New Brunswick, N.J. 08854
Henderson, Robert	Director of Inst. Research, University of Hartford, 200 Bloomfield Ave., West Hartford, Ct. 06117
Higginbotham, J. Ashley	Director of Inst. Research, Monroe Community College Box 9720, Rochester, N.Y. 14623

Higgins, Martin	Director, Research, West Chester State College West Chester, Pa. 19380
Hindle, Geraldine	Off. of Analystical Studies and Planning, Boston Univ. 141 Bay State Road, Boston, Ma. 02215
Hoelcle, Larene	Research Associate, Student Testing and Research State Univ. of N.Y. at Buffalo, Buffalo, N.Y. 14214
Hood, Erwin O.	Manager, Business Off. Husson College, Bangor, Me. 04401
Irwin, Sandra	Research Asst., Charles County Community College, P.O. Box 910, La Plata, Md. 20646
Katz, Adolph	Director, Dept. Higher Education, State of New Jersey 225 West State St., Trenton, N.J. 08625
Kaufman, Barry	Off. Program & Policy Research, CUNY, 535 East 80th St. New York, N.Y. 10021
Kegan, Daniel	Off. of Inst. Research & Eval., Hampshire College, Amherst, Ma. 01002
Kenepp, Paul	Systems Planning Specialist, Inst. Res. Div., Off. of Budget and Planning, Pa. State Univ., Univ. Park, Pa. 16802
King, John H.	Director, Off. of Inst. Analysis, 102 Levering Hall, East Range, Univ. of Va., Charlottesville, Va. 22903
Knapp. Elizabeth A.	Inst. Research, SUNY at Binghamton, Binghamton, N.Y. 14901
Klein, Dottie	Asst. to Director of Inst. Res. Univ. of Conn. U-135 Storrs, Ct. 06268
Kojaku, Lawrence K.	School of Education, New York Univ. 239 Greene St. New York, N.Y. 10003
Kuntz, Allen H.	Prof. of Educ. Psych, SUNY at Buffalo, 316 Harriman Library, Buffalo, New York 14214
Larkin, Paul	Dir. of Inst. Research, Prince George's Community College, 301 Largo Road, Largo Md. 20870
Lewis, Jacqueline	Assoc, Dean, Rutgers University, University College, New Brunswick, N.J. 08903
Lewis, Richard S.	V-P for Admin., Univ. of Hartford, 200 Bloomfield Ave. West Hartford, Ct. 06117
Lewis, Robert T.	Staff Assistant, Univ. of Mass. 303 Whitmore Admin. Bldg. Amherst, Mass. 01002

Locher, Nancy C.	Assoc. Dean of Students, Gettysburg College, Gettysburg, Pa. 17325
Lorang, Wendall	Assoc, for Inst. Research, SUNY at Albany, 1400 Washington Ave., Albany, N.Y. 12222
Lotito, Richard J.	Registrar, Soughampton College of L.I.U., Montauk Highway, Southampton, N.Y. 11968
Love, Sister Marie G.	Mt. Saint Mary College, Newburgh, N.Y. 12550
Loveland, Susan A.	Program and Policy Research, CUNY, 535 East 80 Street New York, N.Y. 10021
Luedeke, J. Barton	Director, Inst. Plan. & Analysis, Rider College 2083 Lawrenceville Rd., Trenton, N.J. 08602
McCarthy, Sister Marjorie	Dir. of Inst. Research, College of Mt. St. Vincent, Riverdale, N.Y. 10471
McGovern, James J.	Connecticut Commission for Higher Education, P.O. Box 1320 Hartford, Ct. 06115
Malinowski, Shirley	Inst. Research Off., University of Connecticut, Storrs, Ct. 06268
Maloney, Mary	Dir. of Inst. Res. & Assoc. Dean of Admissions, St. John's Univ. Utopia & Grand Central Parkways Jamaica, N.Y. 11439
Marchand, Dale P.	Asst. to Acad. VP, Indiana Univ. of Pa., 213 Clark Hall Indiana, Pa. 15701
Mapstone, L. Jay	Registrar, Nyack College, Nyack, N.Y. 10960
Marshall, James	West Chester State College, College Ave. & High Street, West Chester, Pa. 19380
Mitchell, Virginia P.	Research Assoc., Off. of Inst. Research, Mercer County Community College, P.O. Box V, 1200 Old Trenton Road, Trenton, N.J. 08690
Morstain, Barry	Assoc. Prof. Coll. of Urban Aff. & Pub. Policy, 109 Hullihen Hall, Univ. of Delaware, Newark, Dl. 19711
Napier, Gordon	Off. of Management Planning, Univ. of Rhode Island, Kingston, R.I. 02881
Neidlein, H. Karl	Analytical Studies, Rutgers Univ. 12 College Ave., New Brunswick, N.J. 08854
Nichols, David	Research Asst. Student Testing and Research, SUNY at Buffalo, Buffalo, N.Y. 14214

O'Brien, William J.	Assoc. Dir. Inst. Research, Fairleigh Dickinson Univ. 1154 River Rd., Teaneck, N.J. 07666
Opacinch, Cheryl	Coord. of Inst. Research, Catonsville Community College, 800 South Rolling Rd., Catonsville, Md. 21228
Park, Eldon	Dir. Inst. Res. Prog. Higher Ed., Educ. Testing Service, Rosedale Rd., Princeton, New Jersey 08540
Parrish, Richard M.	Dir. Inst. Research, Ocean County College, Hooper Ave. Toms River, N.J. 08753
Pascarella, Ernest	Assoc. in Devel. & Eval., Center for Instructional Devel., Syracuse Univ., 115 College Place, Syracuse, N.Y. 13210
Pearson, Donald	Management Coord., N.H. College & Univ. Council, 2321 Elm St. Manchester, N.H. 03104
Peterson, Bruce	V-P for Inst. Planning, Stockton State College, Pomona, N.J. 08240
Peterson, Charles E., Jr.	Vice Pres. & Dean, Cedar Crest College, Allentown, Pa. 18104
Philliou, Peter	Wentworth College of Technology (Institute) 550 Huntington Ave., Boston, Ma. 02115
Podell, Lawrence	Dean, CUNY, 535 East 80th St., New York, N.Y. 10021
Piesco, Judith	Office of Program and Policy, CUNY, 535 East 80th St., New York, N.Y. 10021
Primosch, Terry	Asst. to Director of Inst. Res. St. John's Univ., Utopia & Grand Central Parkways, Jamaica, N.Y. 11439
Regala, Robert J.	Planning & Research, Box 842 Greene Hall, Alfred University, Alfred, N.Y. 14802
Rossi, Gilbert A.	Assoc. for Inst. Analysis, Rider College, 2083 Lawrenceville Road, Trenton, New Jersey 08602
Rouse, Robert S.	V-P for Academic Affairs, Monmouth College, W. Long Branch, New Jersey 07764
Selgas, James W.	Director, Research & Community Res., Harrisburg Comm. College, 3300 Cameron St., Harrisburg, Pa. 17110
Sendrow, Terry	Director, Inst. Res., Temple University, Phila., Pa. 19122
Sennett, Jill	Tech. Assist., Inst. Res., Mercer County Community Coll. Trenton, New Jersey 08690
Sheridan, Judi	Program Development Spec., Camden Co. College, Box 200, Blackwood, New Jersey 08012

Smith, J. David	Asst. Dean for Freshmen, Widener College, Chester, Pa. 19013
Smith, James A.	Dir., Inst. Research, Univ. of New Hampshire, Thompson Hall, Durham, New Hampshire 03824
* Succop, Paul	Research Asst., Student Testing and Research, SUNY at Buffalo, Buffalo, N.Y. 14214
Terenzini, Patrick	Research Div. Student Affairs, Syracuse Univ. Holden Observatory, Syracuse, N.Y. 13210
Torrence, Lois E.	Dir. Inst. Research, Univ. of Conn., Central Office, Storrs, Ct. 06268
Tschechtelin, James D.	Res. & Management, Info. Specialist, Maryland State Board for Comm. Colleges, Rm. #307, State Treasury Bldg., Annapolis, Md. 21404
Van Blarcom, Phil	Coord., Inst. Res., Somerset County College, P.O. Box 3300, Somerville, N.J. 08876
Van Orden, Wayne	Asst. to Registrar, New Jersey Inst. of Tech., 323 High St., Newark, N.J. 07102
Volker, David	Res. Analyst, Ed. Research, Union Co. Tech. Inst.and Vocational School, Scotch Plains, N.J. 07076
Watts, **William** W.	Reg. & Dir. of Inst. Research, The King's College, Briarcliff Manor, N.Y. 10510
* Wittstruck, John R.	Admin. Sys. Analyst, Off. of Inst. Res., SUNY Coll. of Envrmtl Sci/Forestry, 206 Bray Hall, Syracuse, NY.13210
Woodard, Robert L.	Inst. Research, 320 Clark Hall, Indiana University, Indiana, Pa. 15701
Wyant, Helen	Student Testing & Res., 316 Harriman Library, SUNY at Buffalo, Buffalo, N.Y. 14214
* Stein, Ronald	Assist. to the President, SUNY at Buffalo, Buffalo, N.Y. 14214
* Welsh, William	Stockton State College, Pomona, N.J. 08240